SHARP PARTS GUIDE

CODE: 00ZER1565PG-E

NEW DRAWER BOX UNIT

ER-1565, XE-1017, ER-2770
ER-2905, ER-2908, ER-2970
ER-1076, ER-2395, ER-2540
ER-3241, ER-5200

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The new type drawer box units have been used for the above models and the list below is the comparision table.

Model	Destination code	Before change						After change						New mark	Effective time
		Part code	M/C	BS	SC	DO	BL	Part code	M/C	BS	SC	DO	BL		
ER1565	SH	GBOXD6864RCZZ	4B/5C	○	○	△	○	GBOXD6917RCZZ	4B/5C	○	○	△	○	N	Jul.'87
ER2395	SH	GBOXD6888RCZZ	4B/5C	○	○	△	△	GBOXD6918RCZZ	4B/8C	○	X	△	○	N	Aug. '87
XE1017	USA	GBOXD6848RCZZ	5B/5C	X	X	X	X	GBOXD6920RCZZ	5B/5C	X	X	X	X	N	Aug. '87
ER1565	USA	GBOXD6876RCZZ	5B/5C	X	X	△	X	GBOXD6921RCZZ	5B/5C	X	X	△	○	N	Aug. '87
	Canada	GBOXD6877RCZZ	4B/5C	X	X	△	X	GBOXD6922RCZZ	4B/5C	X	X	△	○	N	Aug. '87
ER1076	KB	GBOXD6879RCZZ	4B/5C	X	X	○	X	GBOXD6923RCZZ	4B/5C	X	X	○	X	N	Aug. '87
	TQ, TR TS	GBOXD6867RCZZ	4B/5C	X	X	△	X	GBOXD6924RCZZ	4B/5C	X	X	△	X	N	Aug. '87
ER2770 ER2905 ER2908 ER2970	TQ, TR TS	GBOXD6808RCZZ	4B/5C	○	○	○	○	GBOXD6925RCZZ	4B/5C	○	○	○	○	N	Aug. '87
ER1076	RC1	GBOXD6865RCZZ	4B/5C	○	○	△	X	GBOXD6928RCZZ	5B/5C	X	X	△	X	N	Sept. '87
ER3241	RB8	GBOXD6809RCZZ	4B/8C	○	X	○	○	GBOXD6932RCZZ	5B/5C	X	X	○	○	N	Sept. '87
ER5200	RB8	GBOXD6878RCZZ	4B/8C	○	X	○	○	GBOXD6935RCZZ	5B/5C	X	X	○	○	N	Sept. '87
ER2540	RB8	GBOXD6822RCZZ	4B/8C	X	X	△	○	GBOXD6937RCZZ	5B/5C	X	X	△	○	N	Sept. '87
ER1910 ER1920	RC1	GBOXD6888RCZZ	4B/5C	○	○	△	△	GBOXD6886RCZZ	5B/5C	X	X	△	△		Sept. '87
ER2908 ER2908B	RC1	GBOXD6816RCZZ	4B/5C	○	○	○	○	GBOXD6810RCZZ	5B/5C	X	X	○	○		Sept. '87
ER3100	RC1	GBOXD6897RCZZ	4B/8C	X	X	△	○	GBOXD6894RCZZ	5B/5C	X	X	△	○		Sept. '87
ER4230	RB8	GBOXD6806RCZZ	4B/8C	○	X	○	○	GBOXD6787RCZZ	5B/5C	X	X	○	○		Sept. '87
ER4630	RC1	GBOXD6776RCZZ	4B/8C	○	X	○	○	GBOXD6787RCZZ	5B/5C	X	X	○	○		Sept. '87

Notes: 1. Abbriviations M/C: Money Case, BS: Bill Separator, SC: Sub Coin Case, DO: Drawer Open sensor micro switch, BL: Bell
2. For those drawer box units without "N" (New mark), refer to each parts guide previously issued.
3. nB/nC means money case compartment layout. Ex. 4B/8C = 4 bills and 8 coins.
○ = Standard feature, △ = Optionally available, X = Not available

SHARP CORPORATION

1 ER-1565 Drawer box unit(for U.S.A.,Canada,SH)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	0AGGCM107SS42	BE	N	D	Drawer cabinet
2	0AGQCW206MKSS	AE		B	Connector with wires (2pin)
4	0AGNRP19B2000	AE		B	Roller
5	0AGXBD805304N	AA		C	Screw (3×4)
6	0AGLBC602MKSS	AG		C	Bill pressure bracket
7	0AGLBC603MKSS	AD		C	Bill pressure sub angle
8	0AGMST601MKSB	AB		C	Bill pressure spring
9	0AGMLV602MKSS	AD		C	Bill pressure lever
10	0AGPSR606MKSS	AE		C	Separator
11	0AGGSP600MKSS	AF		C	Bill separator [SH]
12	0AGGSP601MKSS	AM		C	Coin sub case [SH]
13	0AGGCP606MKSS	AW		C	Coin case
15	0AGGDW403S423	AP		D	Drawer case (Front plate)
16	0AGGLG800K230	AB		C	Stopper rubber (K23)
17	0AGXBD201415S	AA		C	Screw (4×15)
18	0AGLKMDC60A01	AH		B	Lock key (1PC)
19	0AGDC60A-010S	AP		B	Lock key (body)
20	0AGMSK801MKSS	AE		C	Lock key spring
21	0AGGiU100SS42	AT		D	Bottom plate
22	0AGGDW402S423	AX		D	Drawer case
23	0AGLXZ801M6SP	AA		C	Spring nut (6mm)
24	0AGXBD803315S	AA		C	Screw (3×15)
25	0AGMST806423A	AC		C	Push out spring
26	0AGGLG802201 7	AB		C	Rubber stopper (Rear) (K2017)
28	0AGLXZ800M4SP	AA		C	Spring nut (4mm)
29	0AGMST809MKSB	AB		C	Bell hammer spring
30	0AGMLF201MKSS	AB		C	Bell hammer
33	0AGRAL202MKSS	AC		C	Bell
34	0AGXBD201306X	AA		C	Screw (3×6)
35	0AGXBD801408W	AA		C	Screw with spring washer (4×8K)
39	0AGRLU208MKSS	AN		C	Plunger
40	0AGMKS210MKSS	AK		C	Lock unit
41	0AGMST800MKSB	AB		C	Spring (For lock cam)
42	0AGLCS202MKSS	AH		C	Unit chassis
43	0AGXBD806406N	AA		C	Screw (4×6)
45	0AGLSG200MKSS	AB		C	Stopper rubber (Front)
51	0AGXBD500306S	AA		C	Screw (3×6S)
52	0AGNRP19B0010	AE		B	Roller
53	0AGVUL200MKSS	AB		C	UL tube
501	0AGCCP606370 0	BD		D	Coin case unit (4B/5C) [SH]
	0AGCCP606450 0	AZ		D	Coin case unit (4B/5C) [Canada]
	0AGCCP606550 0	BA		D	Coin case unit (5B/5C) [U.S.A.]
	(Unit)				
901	GBŌXD6917RCZZ	BN	N	E	Drawer box unit [SH]
	GBŌXD6922RCZZ	BP	N	E	Drawer box unit [Canada]
	GBŌXD6921RCZZ	BP	N	E	Drawer box unit [U.S.A.]

Note: The parts for micro switch (No. 3, 31, 32 and 36) shown in the illustration are optional devices. See service manual ER-1565 for the parts code and installation.
The bill separtor (No. 11) and Coin sub case (No. 12) are not included for U.S.A. and Canada models.

2 XE-1017 Drawer box unit(for U.S.A.)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	0AGGCM108SS42	BD	N	D	Drawer cabinet
2	0AGQCW201MKSS	AD	N	C	Connector with wires(for plunger)
4	0AGNRP19B2000	AE		B	Roller
5	0AGXBD805304N	AA		C	Screw (3×4)
6	0AGLBC602MKSS	AG		C	Bill pressure bracket
7	0AGLBC603MKSS	AD		C	Bill pressure sub angle
8	0AGMST601MKSB	AB		C	Bill pressure spring
9	0AGMLV602MKSS	AD		C	Bill pressure lever
10	0AGPSR606MKSS	AE		C	Separator
13	0AGGCP606MKSS	AW		C	Coin case
15	0AGGDW403S423	AP		D	Drawer case (Front plate)
16	0AGGLG800K230	AB		C	Stopper rubber (K23)
17	0AGXBD201415S	AA		C	Screw (4×15)
18	0AGLKMDC60A01	AH		B	Lock key (1PC)
19	0AGDC60A−010S	AP		B	Lock key (body)
20	0AGMSK801MKSS	AE		C	Lock key spring
21	0AGGiU100SS42	AT		D	Bottom plate (SS423)
22	0AGGDW402S423	AX		D	Drawer case
23	0AGLXZ801M6SP	AA		C	Spring nut (6㎜)
24	0AGXBD803315S	AA		C	Screw (3×15)
25	0AGMST806423A	AC		C	Push out spring
26	0AGGLG8022017	AB		C	Rubber stopper (Rear) (K2017)
28	0AGLXZ800M4SP	AA		C	Spring nut (4㎜)
34	0AGXBD201306X	AA		C	Screw (3×6)
39	0AGRLU201MKSS	AQ	N	B	Plunger
40	0AGMKS217MKSS	AK		C	Lock unit
41	0AGMST800MKSB	AB		C	Spring (for lock cam)
42	0AGLCS206MKSS	AH		C	Unit chassis
45	0AGLSG200MKSS	AB		C	Stopper rubber (Front)
51	0AGXBD500306S	AA		C	Screw (3×6S)
52	0AGNRP19B0010	AE		B	Roller
53	0AGVUL207MKSS	AB	N	D	UL tube
501	0AGCCP606550O	BA		D	Coin case unit (5B/5C)
	(Unit)				
901	GBOXD6920RCZZ	BP	N	E	Drawer box unit

Note: The following parts shown in the illustration are not included or mounted forXE-1017.
No. 3, 31, 32, 36 = Micro switch
No. 29, 30, 33, 35, 43 = Drawer bell
No. 11, 12 = Bill separator and Coin sub case.

3 ER-2270, ER-2905, ER-2908, ER-2970 Drawar box unit (for TQ, TR, TS)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	0AGGCM109SS42	BD	N	D	Drawer cabinet
2	0AGQCW200MKSS	AF		B	Connector with wires
4	0AGNRP19B2000	AE		B	Roller
6	0AGLBC602MKSS	AG		C	Bill pressure bracket
7	0AGLBC603MKSS	AD		C	Bill pressure sub angle
8	0AGMST601MKSB	AB		C	Bill pressure spring
9	0AGMLV602MKSS	AD		C	Bill pressure lever
10	0AGPSR606MKSS	AE		C	Separator
11	0AGGSP600MKSS	AF		C	Bill separator
12	0AGGSP601MKSS	AM		C	Coin sub case
13	0AGGCP606MKSS	AW		C	Coin case
15	0AGGDW403S423	AP		D	Drawer case (Front plate)
16	0AGGLG800K230	AB		C	Stopper rubber (K23)
17	0AGXBD201415S	AA		C	Screw (4×15)
18	0AGMSK801MKSS	AE		C	Lock key spring
19	0AGDC60A-010S	AP		B	Lock key body (body)
20	0AGLKMDC60A01	AH		B	Lock key (1PC)
21	0AGGiU103SS42	AT	N	D	Bottom plate
22	0AGGDW409S423	AX		D	Drawer case (Without front plate)
23	0AGLXZ801M6SP	AA		C	Spring nut (6mm)
24	0AGMST806423A	AC		C	Push out spring
25	0AGXBD803315S	AA		C	Screw (3×15)
26	0AGGLG802217	AB		C	Rubber stopper (Rear) (K2017)
28	0AGLXZ800M4SP	AA		C	Spring nut (4mm)
31	0AGPSP200MKSS	AB		C	Spacer (Insulator sheet)
32	0AGQSW200MKSS	AL		B	Micro switch
33	0AGRAL201MKSS	AD		B	Bell
34	0AGXBD201306X	AA		C	Screw
35	0AGXBD801408W	AA		C	Screw (4×8K)
36	0AGXBD202314X	AA		C	Screw (3×14)
39	0AGRLU205MKSS	AQ		B	Plunger (With Diode)
40	0AGMKS212MKSS	AK		C	Lock unit
41	0AGMST800MKSB	AB		C	Spring (For lock cam)
42	0AGLCS201MKSS	AH		C	Unit chassis
43	0AGXRD800506O	AA		C	E type ring (5mm)
45	0AGLSG200MKSS	AB		C	Stopper rubber (Front)
51	0AGXBD500306S	AA		C	Screw (3×6S)
52	0AGNRP19B0010	AE		B	Roller
53	0AGVUL202MKSS	AB		C	UL tube
54	0AGMLF211MKSS	AB		C	Lever
55	0AGXRD801406O	AA		C	E type ring (4mm)
56	0AGXBD805304N	AA		C	Screw (3×4)
57	0AGMST801MKSB	AB		C	Bell hammer spring
58	0AGMLF200MKSS	AE		C	Bell hammer
501	0AGCCP6063700	BD		D	Coin case unit (4B/5C)
	(Unit)				
901	GBOXD6925RCZZ	BQ		E	Drawer box unit

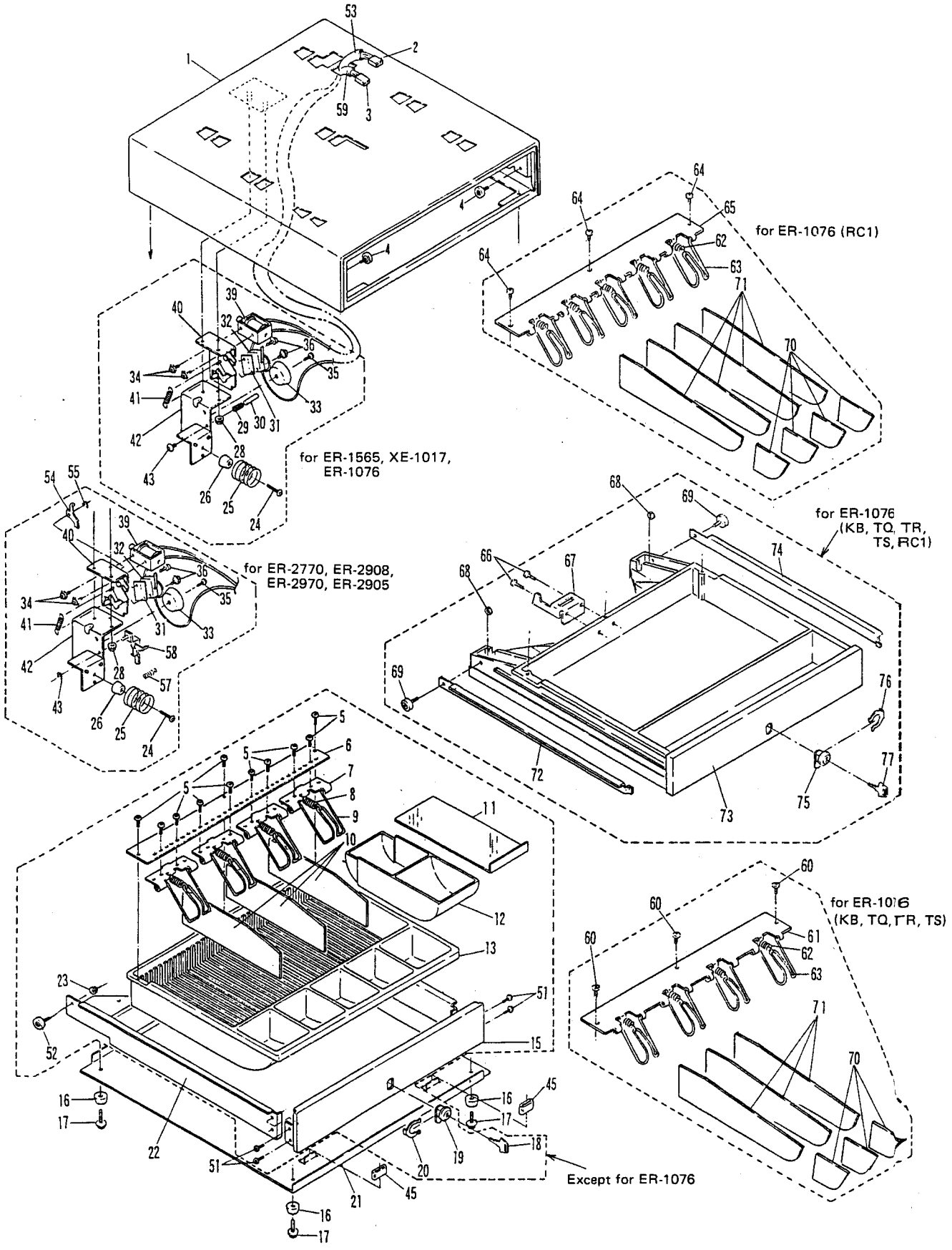
4 ER-1076 Drawer box unit(for KB,TQ,TR,TS,RC1)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	0AGGCM107SS42	BE	N	D	Drawer cabinet	[KB,TQ,TR,TS]
	0AGGCM123S423	BC		D	Drawer cabinet	[RC1]
2	0AGQCW206MKSS	AE		B	Connector with wire (2pin)	
3	0AGQCW230MKSS	AE		C	Connector with wire (for micro switch)	[KB=Standard, TQ/TR/TS/RC1=Option]
4	0AGNRP19B2000	AE		B	Roller	
16	0AGGLG800K230	AB		C	Stopper rubber (K23)	
17	0AGXBD201415S	AA		C	Screw (4×15)	
21	0AGGiU100SS42	AT		D	Bottom plate (SS423)	[KB,TQ,TR,TS]
	0AGGiU114S423	AM		C	Bottom plate	[RC1]
24	0AGXBD803315S	AA		C	Screw (3×15)	
25	0AGMST806423A	AC		C	Push out spring	
26	0AGGLG802201 7	AB		C	Rubber stopper (Rear) (K2017)	
28	0AGLXZ800M4SP	AA		C	Spring nut (4㎜)	
31	0AGPSP200MKSS	AB		C	Spacer (Insulator sheet)	[KB=Standard, TQ/TR/TS/RC1=Option]
32	0AGQSW200MKSS	AL		B	Micro switch	[KB=Standard, TQ/TR/TS/RC1=Option]
34	0AGXBD201306X	AA		C	Screw (3×6)	
36	0AGXBD202314X	AA		C	Screw (3×14)	[KB=Standard, TQ/TR/TS/RC1=Option]
39	0AGRLU208MKSS	AN		C	Plunger	[KB,TQ,TR,TS]
	0AGRLU202MKSS	AN		B	Plunger	[RC1]
40	0AGMKS210MKSS	AK		C	Lock unit	
41	0AGMST800MKSB	AB		C	Spring (For lock cam)	
42	0AGLCS202MKSS	AH		C	Unit chassis	
45	0AGLSG200MKSS	AB		C	Stopper rubber (Front)	
53	0AGVUL200MKSS	AB		C	UL tube	
59	0AGVUL208MKSS	AB	N	C	UL tube	[KB]
60	0AGXBD804308B	AA	N	C	Screw (3×8)	[KB,TQ,TR,TS]
61	0AGLBC611MKSS	AG		C	Bill pressure bracket	[KB,TQ,TR,TS]
62	0AGMST601MKSB	AB		C	Bill pressure spring	
63	0AGMLV602MKSS	AD		C	Bill pressure lever	
64	0AGXBD804306B	AA		C	Screw (3×6)	[RC1]
65	0AGLBC666MKSS	AG	N	C	Bill pressure bracket	[RC1]
66	0AGXBD601410B	AA		C	Screw (4×10)	
67	0AGMVP400MKSS	AE		C	Lock lever	
68	0AGXSD500M6NT	AA		C	Nut (M6)	
69	0AGNRP19B2000	AE		B	Roller	
70	0AGPSR401MKSS	AE		C	Coin separator plate	
71	0AGPSR400MKSS	AD		C	Bill separator plate	
72	0AGRAi401S423	AD		C	Rail(left)	
73	0AGGDW430S423	AY		C	Money case	
74	0AGRAi400S423	AD		C	Rail(right)	
75	0AGKAG010B010	AP		B	Lock key (body)	
76	0AGMSK805MKSS	AE		C	Lock key spring	
77	0AGLKM010B010	AH		B	Lock key (1PC)	
	(Unit)					
901	GBŌXD6923RCZZ	BP	N	E	Drawer box unit	[KB]
	GBŌXD6924RCZZ	BN	N	E	Drawer box unit	[TQ,TR,TS]
	GBŌXD6928RCZZ	BP	N	E	Drawer box unit	[RC1]

Note: The parts for micro switch (No. 3, 31, 32 and 36) are standard feature for KB model, but optional devices for TQ/TR/TS/RC1 models. See service manual ER-1076 for installation and parts code.
The parts for drawer bell (No. 29, 30, 33, 35 and 43) shown in the illustration are not mounted for all KB/TQ/TR/TS/RC1 models.

ER1565DW

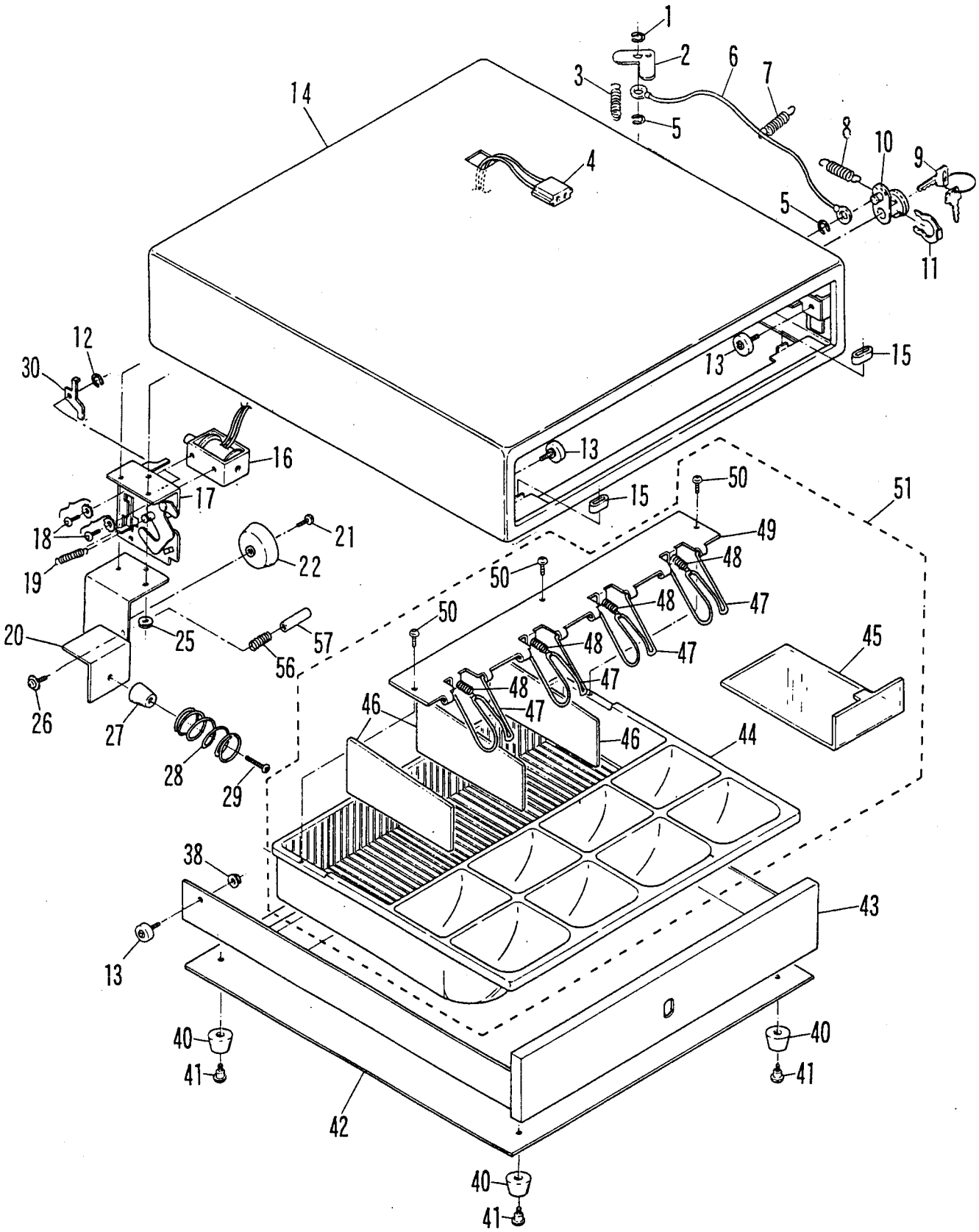
1 ~ 4 Drawer box unit


for ER-1076 (RC1)
for ER-1565, XE-1017, ER-1076
for ER-2770, ER-2908, ER-2970, ER-2905
for ER-1076 (KB, TQ, TR, TS, RC1)
for ER-1076 (KB, TQ, TR, TS)
Except for ER-1076

5 ER-2395 Drawer box unit(for SH)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	0AGXRD8023060	AA		C	E type ring (3mm)
2	0AGMAM202MKSS	AD		C	Open arm
3	0AGMST200MKSB	AB	N	C	Open arm spring
4	0AGQCW206MKSS	AE		B	Connector with wire (2pin)
5	0AGXRD8014060	AA		C	E type ring (4mm)
6	0AGWiR200MKSS	AK		C	Open wire
7	0AGMST800MKSB	AB		C	Spring (For open wire)
8	0AGMST800MKSB	AB		C	Spring (For lock cam)
9	0AGLKMKSA1680	AF		B	Lock key
10	0AGKSA168101S	AL		B	Lock key (Body)
11	0AGMSK800MKSS	AC		C	Lock key spring
12	0AGXRD8014060	AA		C	E type ring (4mm)
13	0AGNRP228B1L00	AE		C	Roller
14	0AGGCM17LS460	BF	N	D	Drawer cabinet
15	0AGLSG200MKSS	AB		C	Stoper rubber (Front)
16	0AGRLU208MKSS	AN		C	Plunger
17	0AGMKS237MKSS	AK	N	C	Lock unit
18	0AGXBD201306X	AA		C	Screw (3×6K)
19	0AGMST800MKSB	AB		C	Spring (For lock cam)
20	0AGLCS202MKSS	AH		C	Unit chassis
21	0AGXBD801408W	AA		C	Screw with (4×8K)
22	0AGRAL202MKSS	AC		C	Bell
23	0AGMLF201MKSS	AB		C	Bell hammer
24	0AGMST809MKSB	AB		C	Bell hammer spring
25	0AGLXZ800M4SP	AA		C	Spring nut (4mm)
26	0AGXBD806406N	AA		C	Screw (4×6)
27	0AGGLG802201 7	AB		C	Rubber stopper (Rear) (K2017)
28	0AGMST805460A	AD		C	Push out spring
29	0AGXBD803315S	AA		C	Screw (3×15)
30	0AGMLF221MKSS	AB		C	Lever
38	0AGLXZ801M6SP	AA		C	Spring nut (6mm)
40	0AGGLG801MKSS	AB		C	Leg (26mm)
41	0AGXBD200415P	AA		C	Screw (4×15)
42	0AGGiU128S460	AS	N	D	Bottom plate
43	0AGGDW425S460	AZ		D	Drawer case
44	0AGGCP614MKSS	AY		C	Money case
45	0AGGSP600MKSS	AF		C	Bill separator
46	0AGPSR600MKSS	AE		C	Bill separator plate
47	0AGMLV600MKSS	AD		C	Bill pressure lever
48	0AGMST600MKSB	AB		C	Bill pressure spring
49	0AGLBC601MKSS	AL		C	Bill pressure bracket (4B)
50	0AGXBD814306B	AA		C	Screw
	(Unit)				
901	GBOXD6918RCZZ	BS	N	E	Drawer box unit

5 ER-2395 Drawer box unit(for SH)

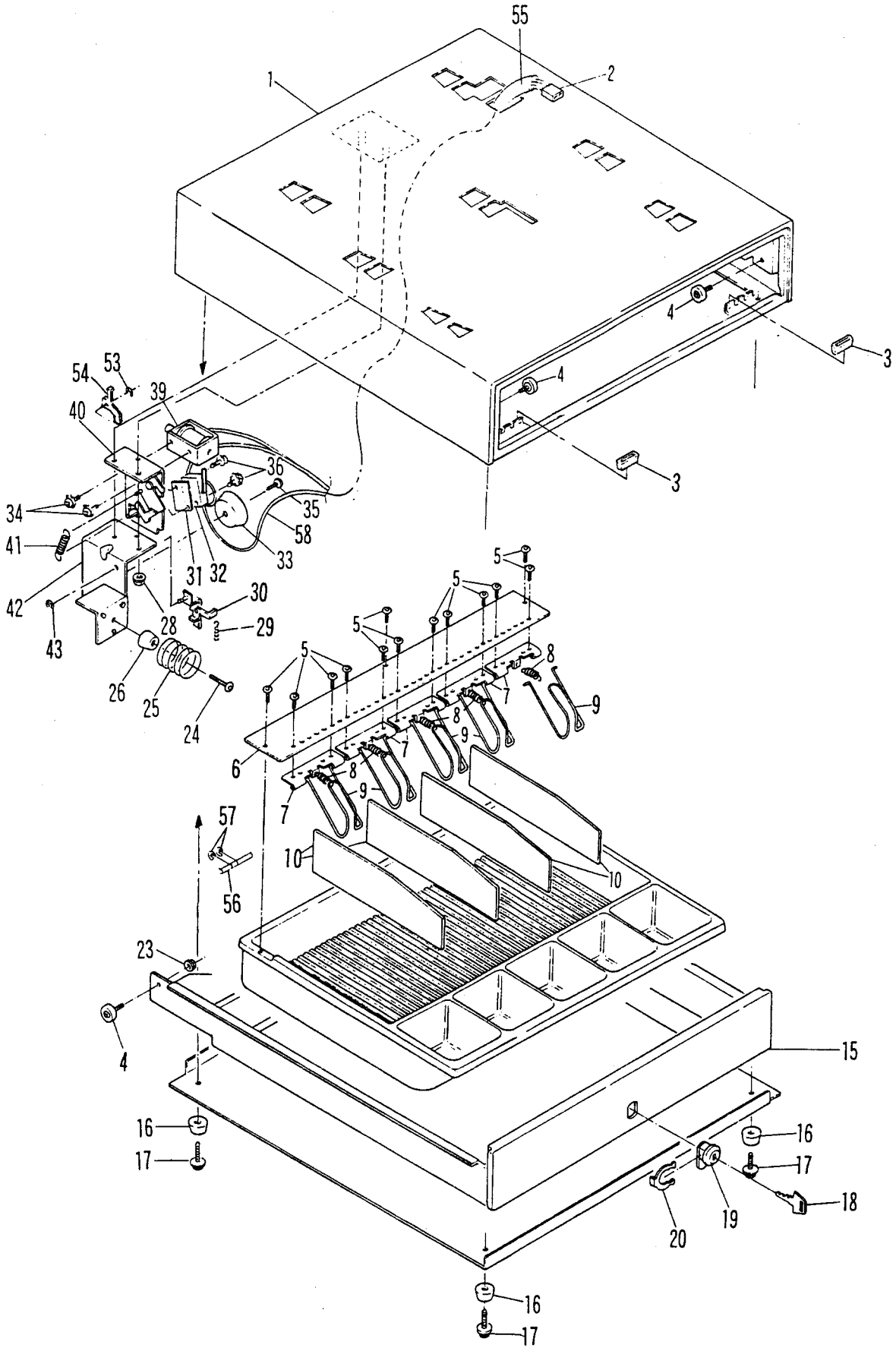


6 ER-2540 ER-3241,ER-5200 Drawar box unit(for RB8)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	0AGGCM179S460	BF	N	D	Drawer cabinet [ER-5200]
	0AGGCM180S460	BF	N	D	Drawer cabinet [ER-3241,ER-2540]
2	0AGQCW211MKSS	AL		B	Connector with wires(for plunger) (3pin) [ER-5200]
	0AGQCW200MKSS	AF		B	Connector with wires(for plunger) (3pin) [ER-3241]
	0AGQCW210MKSS	AF		B	Connector with wires(for plunger) (2pin) [ER-2540]
3	0AGLSG200MKSS	AB		C	Stoper rubber (Front)
4	0AGNRP22B1L00	AE		C	Roller
5	0AGXBD805304N	AA		C	Screw (3×4)
6	0AGLBC602MKSS	AG		C	Bill pressure bracket
7	0AGLBC603MKSS	AD		C	Bill pressure sub angle
8	0AGMST601MKSB	AB		C	Bill pressure spring
9	0AGMLV602MKSS	AD		C	Bill pressure lever
10	0AGPSR606MKSS	AE		C	Separator
13	0AGGCP606MKSS	AW		C	Coin case
15	0AGGDW452S460	AZ	N	D	Drawer case
16	0AGGLG801MKSS	AB		C	Leg (26mm)
17	0AGXBD200415P	AA		C	Screw (4×15)
18	0AGLKMDC60A01	AH		B	Lock key (1PC)
19	0AGDC60A−010S	AP		B	Lock key (body)
20	0AGMSK801MKSS	AE		C	Lock key spring
21	0AGGiU142546O	AS	N	D	Bottom cabinet
23	0AGLXZ801M6SP	AA		C	Spring nut
24	0AGXBD803315S	AA		C	Screw (3×15)
25	0AGMST805460A	AD		C	Push out spring
26	0AGGLG802201 7	AB		C	Rubber stopper (Rear) (K2017)
28	0AGLXZ800M4SP	AA		C	Spring nut (4mm)
29	0AGMST813MKSB	AB		C	Bell hammer spring
30	0AGMLF204MKSS	AE		C	Bell hammer
31	0AGPSP200MKSS	AB		C	Spacer (Insulator sheet) [ER-5200,ER-3241]
32	0AGQSW200MKSS	AL		B	Micro switch [ER-5200,ER-3241]
33	0AGRAL201MKSS	AD		B	Bell
34	0AGXBD201306X	AA		C	Screw with washer (3×6)
35	0AGXBD801408W	AA		C	Screw (4×8K)
36	0AGXBD202314X	AA		C	Screw with washer (3×14) [ER-5200,ER-3241]
39	0AGRLU205MKSS	AQ		B	Plunger (With Diode)
40	0AGMKS212MKSS	AK		C	Lock unit
41	0AGMST800MKSB	AB		C	Spring (For lock cam)
42	0AGLCS201MKSS	AH		C	Unit chassis
43	0AGXRD800506O	AA		C	E type ring (5mm)
53	0AGXRD801406O	AA		C	E type ring (4mm)
54	0AGMLF220MKSS	AB		C	Lever
55	0AGVUL202MKSS	AB		C	Vinyl tube [ER-3241]
56	0AGLPS500MKSS	AC		C	Lock pin
57	0AGXRD801406O	AA		C	E type ring (4mm)
58	0AGQCW208MKSS	AB		C	Lead wire for micro switch [ER-5200,ER-3241]
501	0AGCCP606550O	BA		D	Coin case unit (5B/5C)
	(Unit)				
901	GBOXD6937RCZZ	BQ	N	E	Drawer box unit [ER-2540]
	GBOXD6932RCZZ	BS	N	E	Drawer box unit [ER-3241]
	GBOXD6935RCZZ	BT	N	E	Drawer box unit [ER-5200]

Note: The parts for micro switch (No. 13, 32, 36 and 58) are standard feature for ER-5200 and ER-3241, but optional divices for ER-2540. See service manual ER-2540 for the parts code and installation.
The model name(s) shown at the right side on the above list shows that the spare parts is exclusively used for such model(s).

6 ER-2540 ER-3241,ER-5200 Drawar box unit(for RB8)



■ Index

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
[G]					
GBÕXD6917RCZZ	1- 901	BN	N	E	
GBÕXD6918RCZZ	5- 901	BS	N	E	
GBÕXD6920RCZZ	2- 901	BP	N	E	
GBÕXD6921RCZZ	1- 901	BP	N	E	
GBÕXD6922RCZZ	1- 901	BP	N	E	
GBÕXD6923RCZZ	4- 901	BP	N	E	
GBÕXD6924RCZZ	4- 901	BN	N	E	
GBÕXD6925RCZZ	3- 901	BQ		E	
GBÕXD6928RCZZ	4- 901	BP	N	E	
GBÕXD6932RCZZ	6- 901	BS	N	E	
GBÕXD6935RCZZ	6- 901	BT	N	E	
GBÕXD6937RCZZ	6- 901	BQ	N	E	
[0]					
0AGCCP6063700	1- 501	BD		D	
〃	3- 501	BD		D	
0AGCCP6064500	1- 501	AZ		D	
0AGCCP6065500	1- 501	BA		D	
〃	2- 501	BA		D	
〃	6- 501	BA		D	
0AGDC60A-010S	1- 19	AP		B	
〃	2- 19	AP		B	
〃	3- 19	AP		B	
〃	6- 19	AP		B	
0AGGCM107SS42	1- 1	BE	N	D	
〃	4- 1	BE	N	D	
0AGGCM108SS42	2- 1	BD	N	D	
0AGGCM109SS42	3- 1	BD	N	D	
0AGGCM123S423	4- 1	BC		D	
0AGGCM17LS460	5- 14	BF	N	D	
0AGGCM179S460	6- 1	BF	N	D	
0AGGCM180S460	6- 1	BF	N	D	
0AGGCP606MKSS	1- 13	AW		C	
〃	2- 12	AW		C	
〃	3- 13	AW		C	
〃	6- 13	AW		C	
0AGGCP614MKSS	5- 44	AY		C	
0AGGDW402S423	1- 22	AX		D	
〃	2- 22	AX		D	
0AGGDW403S423	1- 15	AP		D	
〃	2- 15	AP		D	
〃	3- 15	AP		D	
0AGGDW409S423	3- 22	AX		D	
0AGGDW425S460	5- 43	AZ		D	
0AGGDW430S423	4- 73	AY		C	
0AGGDW452S460	6- 15	AZ	N	D	
0AGGiU100SS42	1- 21	AT		D	
〃	2- 21	AT		D	
〃	4- 21	AT		D	
0AGGiU103SS42	3- 21	AT	N	D	
0AGGiU114S423	4- 21	AM		C	
0AGGiU128S460	5- 42	AS	N	D	
0AGGiU1425460	6- 21	AS	N	D	
0AGGLG800K230	1- 16	AB		C	
〃	2- 16	AB		C	
〃	3- 16	AB		C	
〃	4- 16	AB		C	
0AGGLG801MKSS	5- 40	AB		C	
〃	6- 16	AB		C	
0AGGLG8022017	1- 26	AB		C	
〃	2- 26	AB		C	
〃	3- 26	AB		C	
〃	4- 26	AB		C	
〃	5- 27	AB		C	
〃	6- 26	AB		C	
0AGGSP600MKSS	1- 11	AF		C	
〃	3- 11	AF		C	
〃	5- 45	AF		C	
0AGGSP601MKSS	1- 12	AM		C	
〃	3- 12	AM		C	
0AGKAG010B010	4- 75	AP		B	
0AGKSA168101S	5- 10	AL		B	
0AGLBC601MKSS	5- 49	AL		C	
0AGLBC602MKSS	1- 6	AG		C	
〃	2- 6	AG		C	
〃	3- 6	AG		C	
〃	6- 6	AG		C	
0AGLBC603MKSS	1- 7	AD		C	
〃	2- 7	AD		C	
〃	3- 7	AD		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
0AGLBC603MKSS	6- 7	AD		C	
0AGLBC611MKSS	4- 61	AG		C	
0AGLBC666MKSS	4- 65	AG	N	C	
0AGLCS201MKSS	3- 42	AH		C	
〃	6- 42	AH		C	
0AGLCS202MKSS	1- 42	AH		C	
〃	4- 42	AH		C	
〃	5- 20	AH		C	
0AGLCS206MKSS	2- 42	AH		C	
0AGLKMDC60A01	1- 18	AH		B	
〃	2- 18	AH		B	
〃	3- 20	AH		B	
〃	6- 18	AH		B	
0AGLKMKSA1680	5- 9	AF		B	
0AGLKM010B010	4- 77	AH		B	
0AGLPS500MKSS	6- 56	AC		C	
0AGLSG200MKSS	1- 45	AB		C	
〃	2- 45	AB		C	
〃	3- 45	AB		C	
〃	4- 45	AB		C	
〃	5- 15	AB		C	
〃	6- 3	AB		C	
0AGLXZ800M4SP	1- 28	AA		C	
〃	2- 28	AA		C	
〃	3- 28	AA		C	
〃	4- 28	AA		C	
〃	5- 25	AA		C	
〃	6- 28	AA		C	
0AGLXZ801M6SP	1- 23	AA		C	
〃	2- 23	AA		C	
〃	3- 23	AA		C	
〃	5- 38	AA		C	
〃	6- 23	AA		C	
0AGMAM202MKSS	5- 2	AD		C	
0AGMKS210MKSS	1- 40	AK		C	
〃	4- 40	AK		C	
0AGMKS212MKSS	3- 40	AK		C	
〃	6- 40	AK		C	
0AGMKS217MKSS	2- 40	AK		C	
0AGMKS237MKSS	5- 17	AK	N	C	
0AGMLF200MKSS	3- 58	AE		C	
0AGMLF201MKSS	1- 30	AB		C	
〃	5- 23	AB		C	
0AGMLF204MKSS	6- 30	AE		C	
0AGMLF211MKSS	3- 54	AB		C	
0AGMLF220MKSS	6- 54	AB		C	
0AGMLF221MKSS	5- 30	AB		C	
0AGMLV600MKSS	5- 47	AD		C	
0AGMLV602MKSS	1- 9	AD		C	
〃	2- 9	AD		C	
〃	3- 9	AD		C	
〃	4- 63	AD		C	
〃	6- 9	AD		C	
0AGMSK800MKSS	5- 11	AC		C	
0AGMSK801MKSS	1- 20	AE		C	
〃	2- 20	AE		C	
〃	3- 18	AE		C	
〃	6- 20	AE		C	
0AGMSK805MKSS	4- 76	AE		C	
0AGMST200MKSB	5- 3	AB	N	C	
0AGMST600MKSB	5- 48	AB		C	
0AGMST601MKSB	1- 8	AB		C	
〃	2- 8	AB		C	
〃	3- 8	AB		C	
〃	4- 62	AB		C	
〃	6- 8	AB		C	
0AGMST800MKSB	1- 41	AB		C	
〃	2- 41	AB		C	
〃	3- 41	AB		C	
〃	4- 41	AB		C	
〃	5- 7	AB		C	
〃	5- 8	AB		C	
〃	5- 19	AB		C	
〃	6- 41	AB		C	
0AGMST801MKSB	3- 57	AB		C	
0AGMST805460A	5- 28	AD		C	
〃	6- 25	AD		C	
0AGMST806423A	1- 25	AC		C	
〃	2- 25	AC		C	

ER1565DW

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
0AGMST806423A	3- 24	AC		C	
〃	4- 25	AC		C	
0AGMST809MKSB	1- 29	AB		C	
〃	5- 24	AB		C	
0AGMST813MKSB	6- 29	AB		C	
0AGMVP400MKSS	4- 67	AE		C	
0AGNRP19B0010	1- 52	AE		B	
〃	2- 52	AE		B	
〃	3- 52	AE		B	
0AGNRP19B2000	1- 4	AE		B	
〃	2- 4	AE		B	
〃	3- 4	AE		B	
〃	4- 4	AE		B	
〃	4- 69	AE		B	
0AGNRP22B1L00	5- 13	AE		C	
〃	6- 4	AE		C	
0AGPSP200MKSS	3- 31	AB		C	
〃	4- 31	AB		C	
〃	6- 31	AB		C	
0AGPSR400MKSS	4- 71	AD		C	
0AGPSR401MKSS	4- 70	AE		C	
0AGPSR600MKSS	5- 46	AE		C	
0AGPSR606MKSS	1- 10	AE		C	
〃	2- 10	AE		C	
〃	3- 10	AE		C	
〃	6- 10	AE		C	
0AGQCW200MKSS	3- 2	AF		B	
〃	6- 2	AF		B	
0AGQCW201MKSS	2- 2	AD	N	C	
0AGQCW206MKSS	1- 2	AE		B	
〃	4- 2	AE		B	
〃	5- 4	AE		B	
0AGQCW208MKSS	6- 58	AB		C	
0AGQCW210MKSS	6- 2	AF		B	
0AGQCW211MKSS	6- 2	AL		B	
0AGQCW230MKSS	4- 3	AE		C	
0AGQSW200MKSS	3- 32	AL		B	
〃	4- 32	AL		B	
〃	6- 32	AL		B	
0AGRAi400S423	4- 74	AD		C	
0AGRAi401S423	4- 72	AD		C	
0AGRAL201MKSS	3- 33	AD		B	
〃	6- 33	AD		B	
0AGRAL202MKSS	1- 33	AC		C	
〃	5- 22	AC		C	
0AGRLU201MKSS	2- 39	AQ	N	B	
0AGRLU202MKSS	4- 39	AN		B	
0AGRLU205MKSS	3- 39	AQ		B	
〃	6- 39	AQ		B	
0AGRLU208MKSS	1- 39	AN		C	
〃	4- 39	AN		C	
〃	5- 16	AN		C	
0AGVUL200MKSS	1- 53	AB		C	
〃	4- 53	AB		C	
0AGVUL202MKSS	3- 53	AB		C	
〃	6- 55	AB		C	
0AGVUL207MKSS	2- 53	AB	N	D	
0AGVUL208MKSS	4- 59	AB	N	C	
0AGWiR200MKSS	5- 6	AK		C	
0AGXBD200415P	5- 41	AA		C	
〃	6- 17	AA		C	
0AGXBD201306X	1- 34	AA		C	
〃	2- 34	AA		C	
〃	3- 34	AA		C	
〃	4- 34	AA		C	
〃	5- 18	AA		C	
〃	6- 34	AA		C	
0AGXBD201415S	1- 17	AA		C	
〃	2- 17	AA		C	
〃	3- 17	AA		C	
〃	4- 17	AA		C	
0AGXBD202314X	3- 36	AA		C	
〃	4- 36	AA		C	
〃	6- 36	AA		C	
0AGXBD500306S	1- 51	AA		C	
〃	2- 51	AA		C	
〃	3- 51	AA		C	
0AGXBD601410B	4- 66	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
0AGXBD801408W	1- 35	AA		C	
〃	3- 35	AA		C	
〃	5- 21	AA		C	
〃	6- 35	AA		C	
0AGXBD803315S	1- 24	AA		C	
〃	2- 24	AA		C	
〃	3- 25	AA		C	
〃	4- 24	AA		C	
〃	5- 29	AA		C	
〃	6- 24	AA		C	
0AGXBD804306B	4- 64	AA		C	
0AGXBD804308B	4- 60	AA	N	C	
0AGXBD805304N	1- 5	AA		C	
〃	2- 5	AA		C	
〃	3- 56	AA		C	
〃	6- 5	AA		C	
0AGXBD806406N	1- 43	AA		C	
〃	5- 26	AA		C	
0AGXBD814306B	5- 50	AA		C	
0AGXRD8005060	3- 43	AA		C	
〃	6- 43	AA		C	
0AGXRD8014060	3- 55	AA		C	
〃	5- 5	AA		C	
〃	5- 12	AA		C	
〃	6- 53	AA		C	
〃	6- 57	AA		C	
0AGXRD8023060	5- 1	AA		C	
0AGXSD500M6NT	4- 68	AA		C	

Table of destinations

SELECTION CODE	COUNTRIES
U	U.S.A., Guam
A	Canada
KA	Australia
KB	U. Kingdom, Scotland
SA	Korea
SB	Saudi Arabia
SBL	Saudi Arabia (Drawer TYPE:Large)
SBS	Saudi Arabia (Drawer TYPE:Small)
SC	Formosa
SD	R. of Colombia, Costa Rica, R. of Guatemala, Honduras, Venezuela, Nicaragua, El Salvador, Mexico, Cuba
SE	Hong Kong
* SG	Kuwait, Lebanon, Bahrain, Thailand, Indonesia (Drawer coin case 4B/3C), Tahiti, Pakistan, Iran, Syria, Turkey, Jordan, Iraq, Sultanate of Oman, Sudan, Egypt (U.A.R.), Re-union
SH	South Africa
SJ	Philippines
SL	New Zealand
SM	Kenya, Malta
SMT	Nigeria, UAE
TQ	SEEG territory other than Germany (Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, Finland, Hungary, Iceland, Italy, Norway, France, Switzerland, Portugal, Netherlands, Poland, Romania, Sweden)
TR	Spain
TS	Germany

RA1	Tunisia, West Africa, Ivory coast, Algeria, Cameroon, Chad, Dahomey, Gabon, Congo, Togo, Senegal, Niger, Burkina Faso, C. Africa
RA2	Argentine Republic, R. of Paraguay
RA3	Greece
RA4	R. of Chile, R. of Uruguay
RA5	Sri Lanka
RA6	
RA7	Curacao, Netherlands Antilles
RA8	Liberia
RA9	R. of Peru

RB1	F. R. of Brazil
RB2	Barbados (220V) REFER TO RB7
* RB3	Indonesia (Drawer coin case 6B/5C)
RB4	
RB5	Cyprus
RB6	R. of Panama
RB7	Barbados (120V) REFER TO RB2
RB8	Malaysia (USA version)
RB9	China

RC1	Malaysia (Europe version)
RC2	Singapore (Europe version)
RC3	Singapore (USA version)
RC4	Thailand (USA version)
RC5	Dominican Republic
RC6	
RC7	
RC8	
RC9	

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP SERVICE MANUAL

ELECTRONIC CASH REGISTER

CONTENTS

1. REFERENCE DOCUMENTS 1
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4. CIRCUIT DESCRIPTIONS 3
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6. ADJUSTMENTS 8
7. TEST FUNCTIONS 8
8. SERVICE PRECAUTION ON THE CPU AND OUTER ROM REPLACEMENT 12

Note: The service manual of the above models is consisted of four major manuals as follows. Therefore, please refer to other manuals together with this service manuals in your service.

1-1.	Section 1 programming manuals for U.S.A., Canada, South Africa, etc.	00ZER2395SMBE
1-2.	Section 1 Basic manuals for Europe, etc.	00ZER1920SMBE
2.	Section 2 Hardware description for all countries (except Japan)	00ZER2395SMHE
3.	Circuit diagram and PWB layout for all countries	00ZER2395CD1M
4.	Printer manual for all countries	00ZCR802ASM/M

Note: Europe Version = U.K., W. Germany, Australia and others.

SHARP CORPORATION

1. Reference Documents

Manual name	Contents	Manual code	New mark	Applicable area and models			
				Europe Version		U.S.A version	
				U.K., Germany, Australia and others		U.S.A., Canada, South Africa and others	
				ER-1910	ER-1920	ER-2385	ER-2395
1) Section 1 Basic manual	Specification, SRV Programming, option etc.	00ZER1920SMBE	N	○			
1) Section 1 Prog. manual		00ZER2395SMBE	N			○	
2) Section 2 Hardware	Circuit description. Dig., Service option etc.	00ZER2395SMHE	N	○		○	
3) Circuit diagram and PWB layout	Main board, key board etc.	00ZER2395CD1M	N	○		○	
4) Printer manual	CR-802, 812, 911A	00ZCR802SM//E		○		○	
	CR-802A, 812A	00ZCR802ASM/M	N	○	○	○	
	CR-911D	00ZCR911DSM/M	N				○
5) Cash register basic manual	Basic circuit descripiton	—		○		○	
6) Operation manual	PGM programming, Registration etc.	TINSE7009RCZZ	N			○ (U.S.A.)	
		TINSM7012RCZZ	N	○			
		TINSK7047RCZZ	N			○ (Except U.S.A.)	

2. Block Diagram

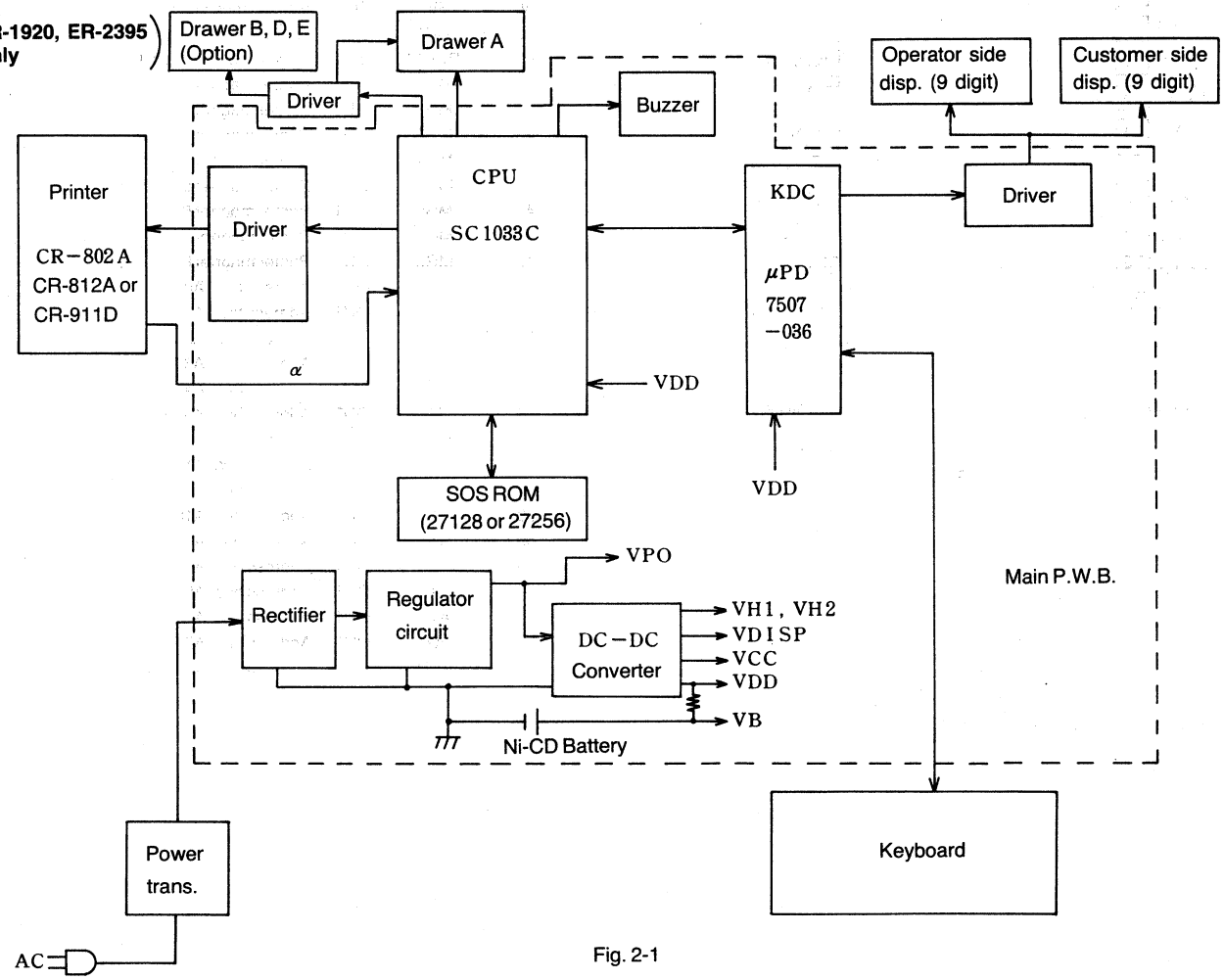


Fig. 2-1

3. CPU pin description

3-1. CPU (SC1033C)

The SC1033C is a single chip microprocessor which has an internal ROM, RAM, and serial I/O.

Pin configuration

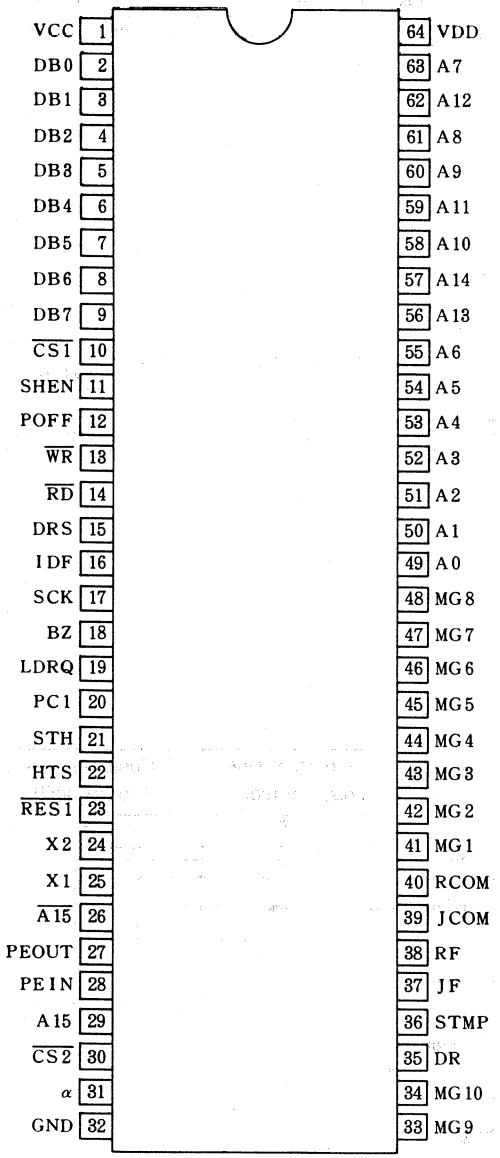


Fig. 3-1

3-2. Signal description

Pin No.	Signal name	I/O	Description
1	Vcc	—	+5V
2 ~ 9	DB0 ~ DB7	I/O	Data bus line
10	$\overline{CS1}$	IN	Chip select 1 (connected with $\overline{A15}$)
11	SHEN	IN	Shift enable
12	POFF	OUT	Not used
13	$\overline{WR}$	OUT	Write signal (normally not used)
14	$\overline{RD}$	OUT	Read signal
15	DRS	IN	Drawer open sensor line (not used)
16	IDF	OUT	Printer motor drive signal
17	SCK	OUT	Shift clock (KDC)
18	BZ	OUT	Buzzer signal
19	LDRQ	OUT	Load request (KDC)
20	PC1	IN	Not used (LSI test pin, normally connected to GND)
21	STH	IN	8-bit serial input (KDC)
22	HTS	OUT	8-bit serial output (KDC)
23	$\overline{RES1}$	IN	Reset input
24	X2	—	3MHz oscillator
25	X1	—	3MHz oscillator
26	$\overline{A15}$	OUT	Address bus, $\overline{A15}$
27	PEOUT	OUT	PE signal output
28	PEIN	IN	PE signal input
29	A15	OUT	Address bus, A15
30	$\overline{CS2}$	OUT	Chip select 2 (normally not used) SOS ROM
31	α	IN	α signal
32	GND	—	GND
33	MG9	OUT	Printer magnet 9
34	MG10	OUT	Printer magnet 10
35	DR	OUT	Drawer open signal
36	STMP	OUT	Stamp signal
37	JF1	OUT	Journal feed signal
38	RF	OUT	Receipt feed signal
39	JCOM	OUT	Journal common signal
40	RCOM	OUT	Receipt common signal
41	MG1	OUT	Printer magnet 1
42	MG2	OUT	Printer magnet 2
43	MG3	OUT	Printer magnet 3
44	MG4	OUT	Printer magnet 4
45	MG5	OUT	Printer magnet 5
46	MG6	OUT	Printer magnet 6
47	MG7	OUT	Printer magnet 7
48	MG8	OUT	Printer magnet 8
49	A0	OUT	Address bus, A0
50	A1	OUT	Address bus, A1
51	A2	OUT	Address bus, A2
52	A3	OUT	Address bus, A3
53	A4	OUT	Address bus, A4
54	A5	OUT	Address bus, A5
55	A6	OUT	Address bus, A6
56	A13	OUT	Address bus, A13
57	A14	OUT	Address bus, A14
58	A10	OUT	Address bus, A10
59	A11	OUT	Address bus, A11
60	A9	OUT	Address bus, A9
61	A8	OUT	Address bus, A8
62	A12	OUT	Address bus, A12
63	A7	OUT	Address bus, A7
64	VDD	—	VDD (rechargeable battery voltage during power down)

3-3. KDC (μPD7507-036)

The μPD7507-036 is called KDC (Key Display Controller) which is used to control the keyboard, display, and clock. Communication is performed with the SC1033C CPU via the 8-bit serial interface.

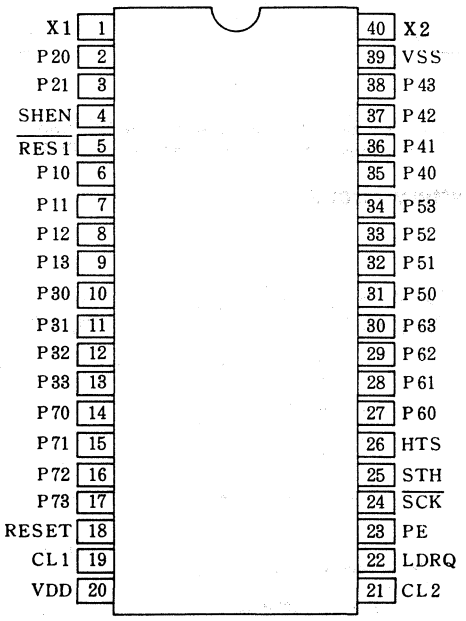
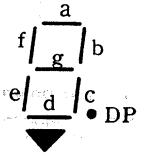


Fig. 3-2

3-4. Signal description

Pin No.	Signal name	I/O	Description
1	X2	—	Timer clock
2	P20	OUT	Key scan signal
3	P21	OUT	Display drive signal 9/key scan signal
4	SHEN	OUT	Shift enable
5	$\overline{RES1}$	OUT	Reset signal
6	P10	IN	Key return signal
7	P11	IN	Key return signal
8	P12	IN	Key return signal
9	P13	IN	Key return signal
10	P30	OUT	Display drive signal 1/key scan signal
11	P31	OUT	Display drive signal 2/key scan signal
12	P32	OUT	Display drive signal 3/key scan signal
13	P33	OUT	Display drive signal 4/key scan signal
14	P70	OUT	Display drive signal 5/key scan signal
15	P71	OUT	Display drive signal 6/key scan signal
16	P72	OUT	Display drive signal 7/key scan signal
17	P73	OUT	Display drive signal 8/key scan signal
18	RESET	INT	Reset input
19	CL1	—	Basic clock
20	VDD	—	VDD (rechargeable battery voltage during power down)
21	CL2	—	Basic clock
22	LDRQ	IN	Load request
23	PE	IN	PE
24	$\overline{SCK}$	IN	Shift clock
25	STH	OUT	Serial output data
26	HTS	IN	Serial input data
27	P60	IN	Key return signal
28	P61	IN	Receipt/journal key return signal
29	P62	IN	Mode switch return signal
30	P63	OUT	Display drive ▼
31	P50	OUT	Display drive g
32	P51	OUT	Display drive f
33	P52	OUT	Display drive e
34	P53	OUT	Display drive d
35	P40	OUT	Display drive c
36	P41	OUT	Display drive b
37	P42	OUT	Display drive a
38	P43	OUT	Display drive DP
39	Vss	—	GND
40	X1	—	Timer clock



4. Circuit description

4-1. Oscillation circuit

(1) CPU clock

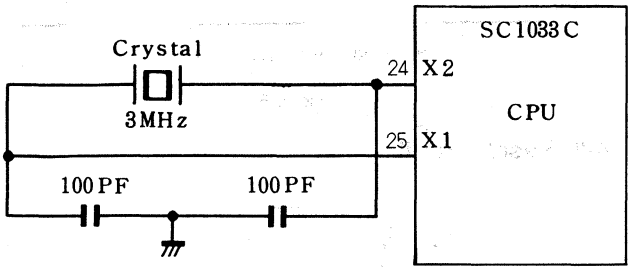


Fig. 4-1

The basic clock is created in the 3MHz crystal oscillator and connected directly with the CPU. The following shows the waveforms of signals, X1 and X2.

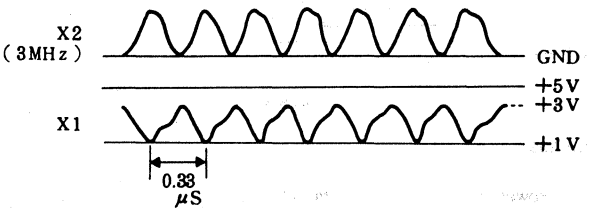


Fig. 4-2

(2) KDC (Key Display Controller) clock

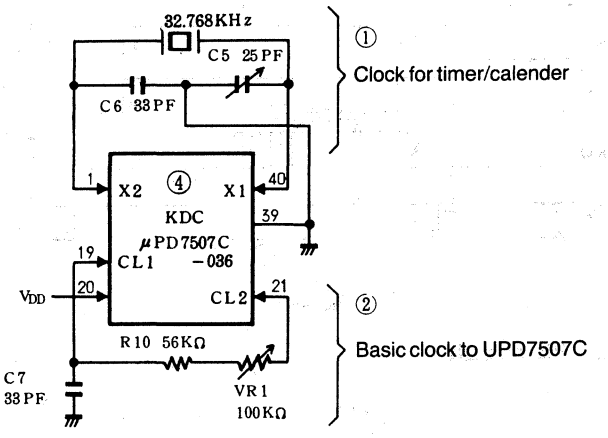


Fig. 4-3

From this circuit is delivered the timer, calendar, and μPD7505C basic clock.

1) Timer and calendar clock
   Clock frequency generated across X1 and X2 is adjusted by the trimmer capacitor (C5) and supplied to the KDC. The trimmer capacitor has been factory adjusted using the error meter, it should never be readjusted.
2) μPD7507C basic clock
   Clock frequency coming across CL1 and CL2 is adjusted by the potentiometer (VR1) and supplied to the KDC.
   Even if this frequency is observed on the oscilloscope, it would not be possible to see an exact waveform because of a capacitance in the probe.
   So, one of the following two methods may be used.

[Adjustment-1]

Observe on the oscilloscope the waveform on the test pin 1 (pin 3) of the μPD7505C and adjust it using VR so that the following waveform can be seen.

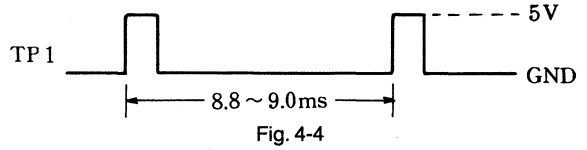


Fig. 4-4

[Adjustment-2]
Execute Job #15 in the SRV mode and adjust VR so that the waveform on TP1 should be as shown below.

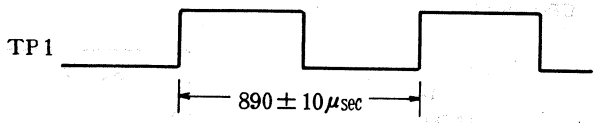


Fig. 4-5

4-2. Reset circuit

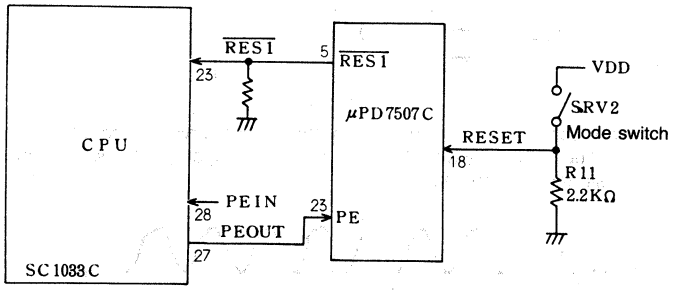


Fig. 4-6

Timings

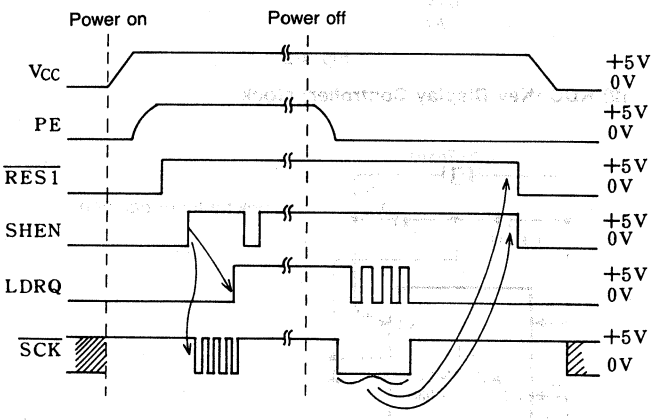


Fig. 4-7

4-3. PE circuit

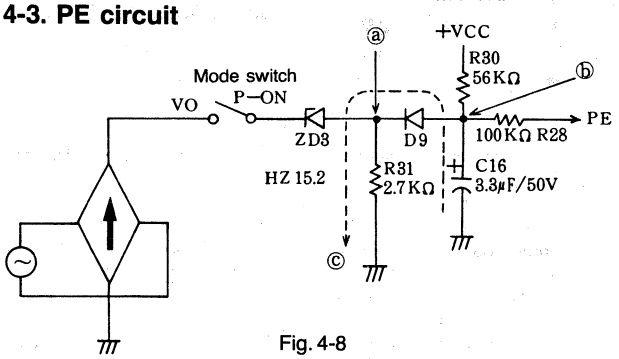


Fig. 4-8

When the mode switch is set to any position other than OFF, the switch shown in the figure above turns on. (VO connected with P-ON.) ⓐ becomes about 18V via ZD3. As the power is turned on, VCC generated in the DC-DC converter turns to 5V. Voltage at point ⓑ of C16 gradually increases by VCC. When VO disengages from P-ON inside the (PE) mode switch, the charge in C16 is discharged to the direction shown with ⓒ because the voltage at point ⓐ becomes null. So, the voltage at point ⓑ drops down to GND level.

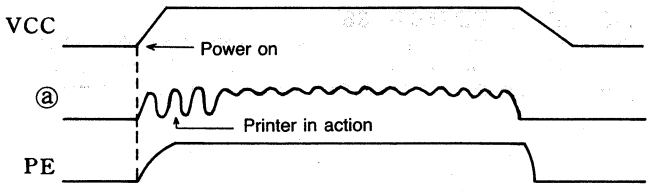


Fig. 4-9

The PE signal is waveform shaved within the SC1033C through the NOT gate and supplied to the CPU and KDC (μPD7507).

4-4. Battery circuit

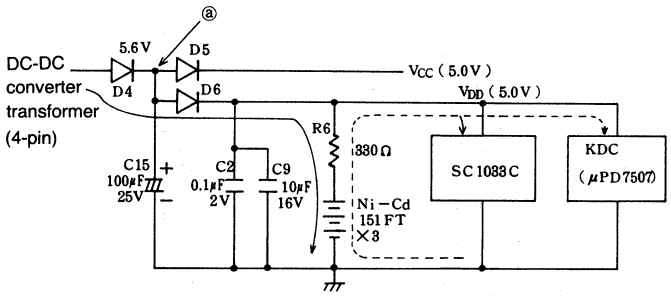


Fig. 4-10

: Battery recharge current

: Battery discharge current

Voltage at each point is as follows:

AC supply	Point ⓐ	V_{DD}
OFF	0V	+3.6V
ON	+5.6V	+5V

4-5. Communication between the CPU and the KDC (μPD7507C)

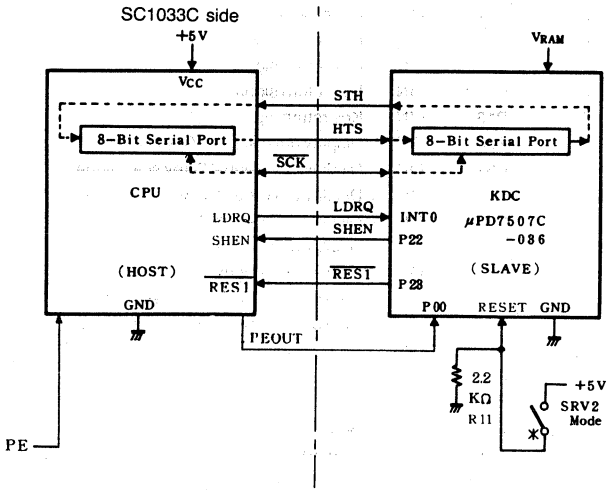


Fig. 4-11

STH	: Serial input
HTS	: Serial output
SCK	: Shift clock
LDRQ	: Load request
SHEN	: Shift enable
RES1	: System reset
PE	: Power down detection
RESET	: KDC reset

(1) During power off
Power is supplied to the KDC even if the power is off. During this period, the KDC performs the following operations.
(KDC operating voltage is +3V to +7V)
1) Keeping time for the timer and calendar.
2) Detection of the PE signal level...The KDC checks the POF signal at 500msec.*

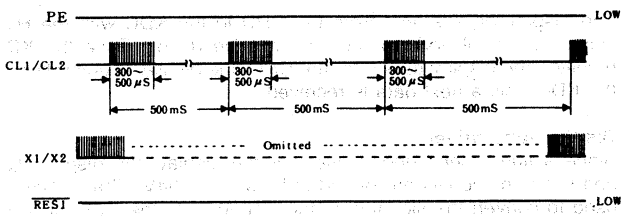


Fig. 4-12

The CPU (SC1033C) is not operating as +5V is not in supply during power off.

(2) When power is turned on

When the power is turned on, PE is forced high and sent to the KDC. The KDC having received a high state of PE, the KDC issues $\overline{RES1}$ to reset the CPU.

(3) When power is turned off

When the power is turned off, PE is forced low and directly sent to the CPU. After the CPU finishes executing the required processing, it sends LDRQ and $\overline{SCK}$ to the KDC requesting to send $\overline{RES1}$. The CPU thus received $\overline{RES1}$ is then reset.

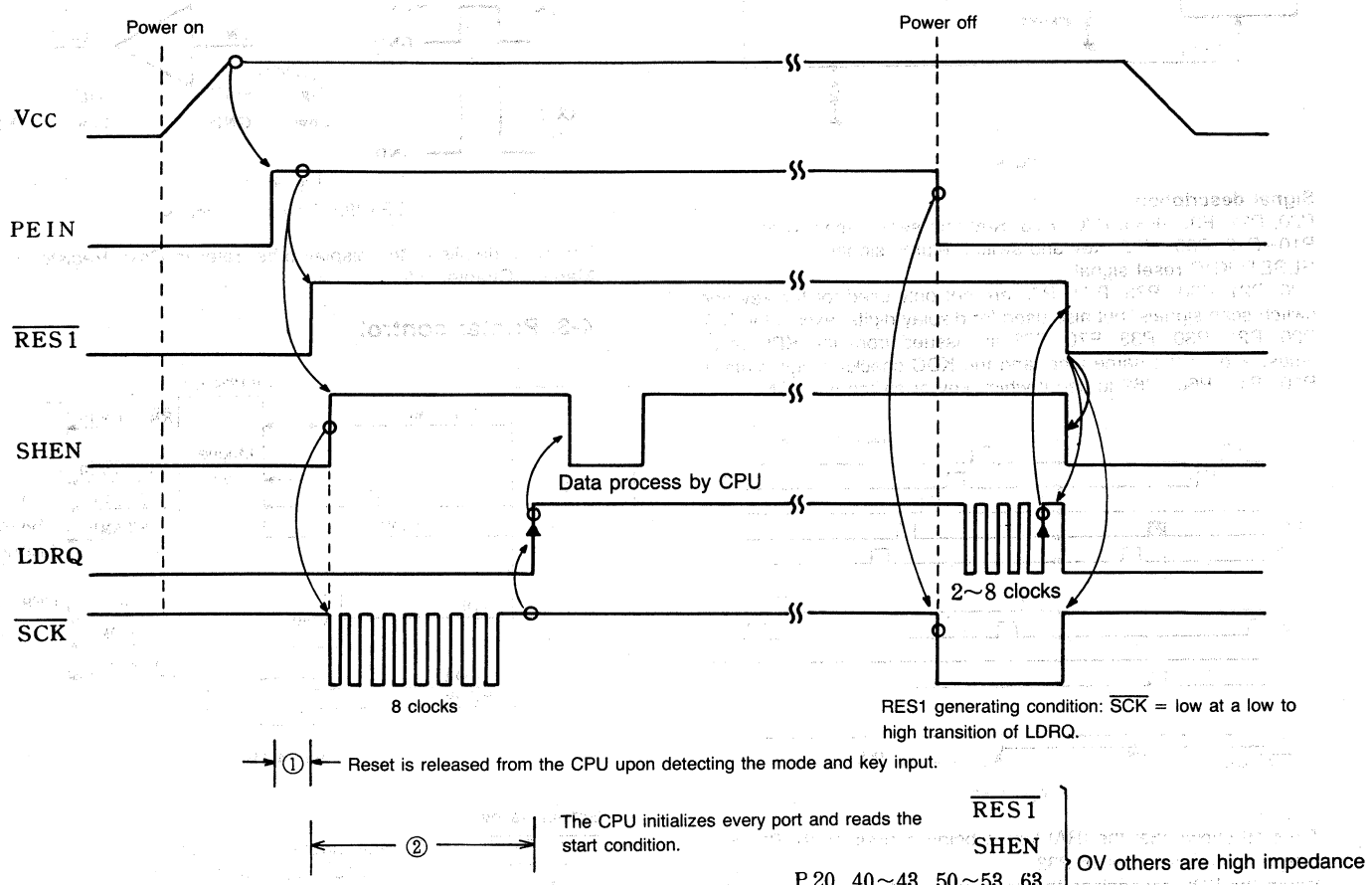


Fig. 4-13

(4) KDC reset

When the mode switch is turned on in the SRV2 mode, RESET is forced high (5V) and the KDC is reset. $\overline{RES1}$ is pulled down with a 12KΩ resistor, the CPU is reset by the $\overline{RES1}$. When it is changed from the SRV2 to SRV1 mode, RESET is forced low and the KDC is released from the reset. Then, the KDC turns $\overline{RES1}$ high to release the CPU from the reset.

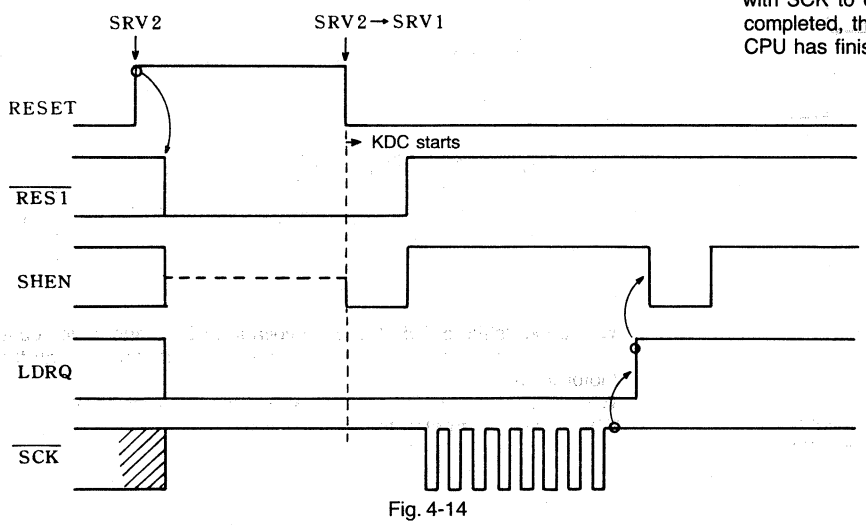


Fig. 4-14

(5) Data transfer between the CPU and the KDC

Data is transferred through the CPU and KDC 8-bit serial port in synchronization with $\overline{SCK}$ received from the CPU.
To transfer data from the CPU to the KDC, the STH line is used. To transfer data from the KDC to the CPU, the HTS line is used. Data transfer can take place with a SHEN which is an output from the KDC. When the CPU senses a high state of SHEN, it responds with $\overline{SCK}$ to carry out data transfer. When data transfer has been completed, the CPU sends a LDRQ to the KDC to inform that the CPU has finished receiving and sending.

4-6. Key and switch read

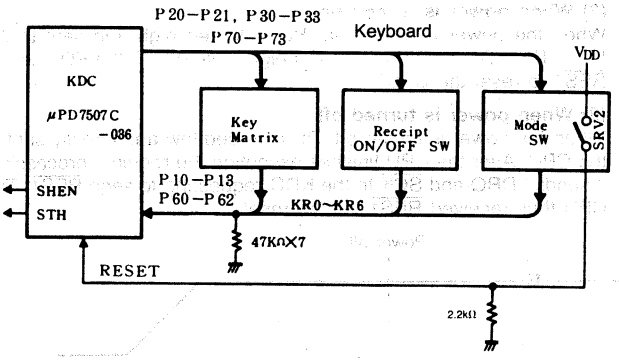


Fig. 4-15

Signal description
P20, P21, P30~P33, P70~P73: Key and switch scan signal
P10~P13, P60~P62: Key and switch returns signal
RESET: KDC reset signal
P20, P21, P30~P33, P70~P73 are not only used for the key and switch scan signals, but also used for display digits, except for P20. P20, P21, P30~P33, P70~P73 are issued from the KDC at all times, and, at the same time, and the KDC checks a high state of P10~P13, P60~P62 to see if which key or switch is at ON.

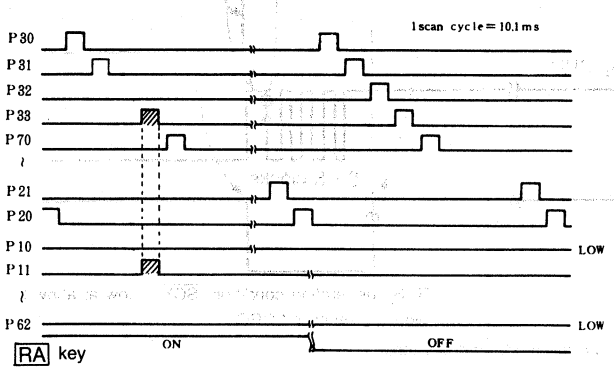


Fig. 4-16

Fig.4-16 shows that the [RA] key is being depressed for P11 is at a high level in the time of P33.
When the KDC recognizes the key depressed, data is sent on the STH line in response to the request from the CPU.

4-7. Display control

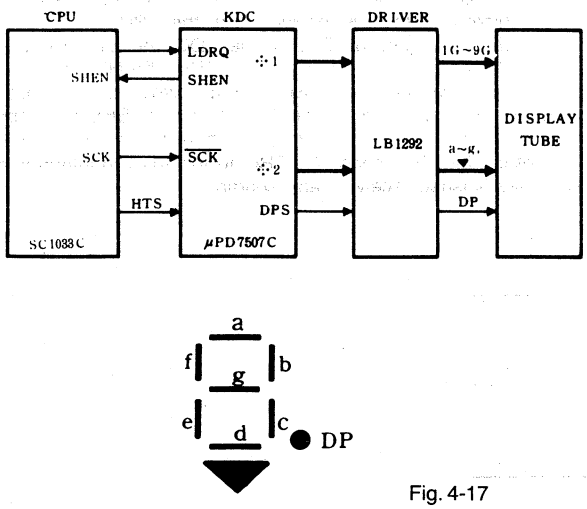


Fig. 4-17

Signal description
*1: P20, P30~P33, P70~P73(1G~9G): Display digit signal
*2: P43~P40, P53~P50, P63(a~g, ▼, DP): Display segment signal
P43 (DP): Decimal point

The display data is sent from the CPU to the KDC with the HTS signal and displayed via the display tube driver. Once the KDC received the display data from the CPU, the display is controlled by the KDC until a next data is received.

Display tube driver
Since a fluorescent tube is used for the display, the display digit and segment signals are operated by about +34V. The LB1292 is used to convert the signal from the TTL level to the +34V level.

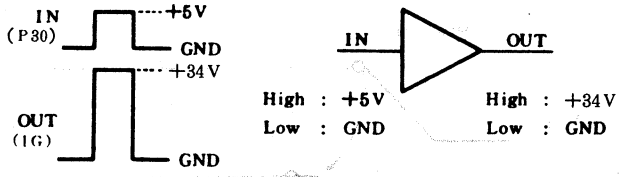


Fig. 4-18

LB1292: Driver×6 circuits

For more details of the display tube, refer to Cash Register Basic Manual, Chapter 9-3.

4-8. Printer control

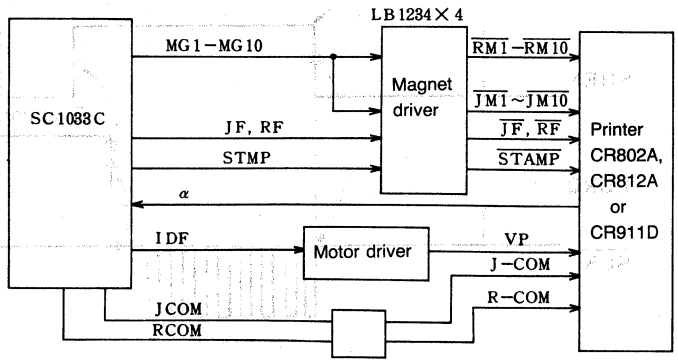


Fig. 4-19

Signal name

RM1~RM10	: Receipt magnet select signal
JM1~JM10	: Recording magnet select signal
JF-JF	: Journal feed signal
RF-RF	: Receipt feed signal
STMP-STAMP	: Stamp signal
α	: Printer interface signal
IDF	: Motor drive signal
JCOM	: Journal common signal
RCOM	: Receipt common signal

For detail of printer, refer to CR802A, CR812A, CR911D, CR-802, CR-812, and CR-911A Printer Manual.

Motor drive circuit

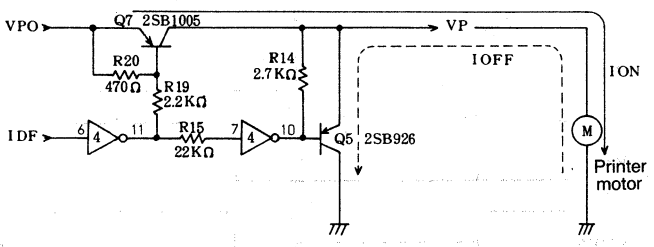


Fig. 4-20

With a high state of IDF, the base voltage of Q7 starts to decrease via IC4 and Q7 goes active which causes ION to flow through the motor to run it.
When IDF goes low, Q7 comes inactive and Q5 turns on. With this, IOFF is applied to stop the motor quickly.

4-9. Drawer control

[Without option drawer]

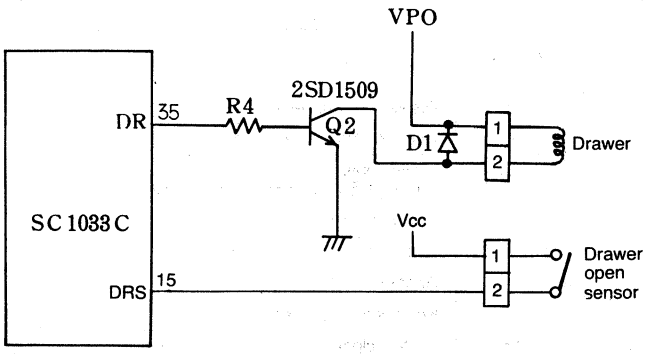


Fig. 4-21

The DR signal output from the pin 35 of the SC1033 drives Q2 to apply current to the drawer magnet. D1 is used to prevent a counter-electromotive force.

[With option drawers]

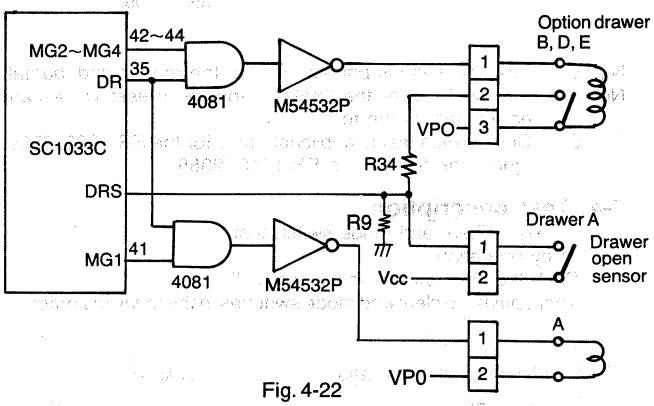


Fig. 4-22

In case an optional drawer is in use, drawers are driven by the DR signal issued from the pin 35 of the SC1033C and MG1 through MG4. A spark killer diode is contained in the M54532P.

4-10. Power supply circuit

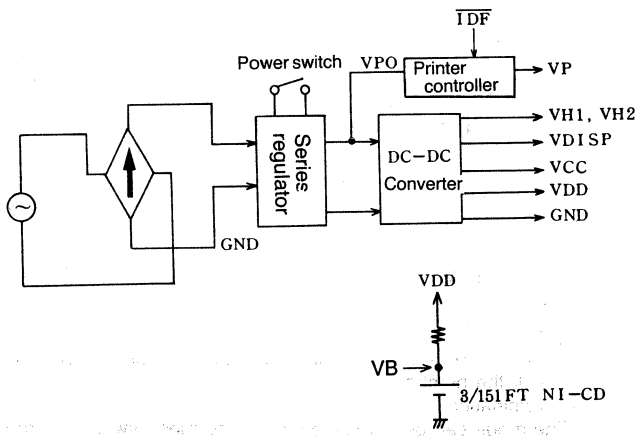


Fig. 4-23

VP0	:	Drawer +17.6V~−19.5V
VP	:	Printer +18V
VH1, VH2	:	Display heater +3.5V (rms)
VDISP	:	Display tube plate and grid +34V (+28.8V~+37.4V)
VCC	:	Circuit drive +5V (+4.5V~+5.5V)
VB	:	Power off time CPU & KDC drive +3.6V, min.
VDD	:	Power supply to CPU and KDC +5V (+4,5V~+5.5V)

VP0 circuit

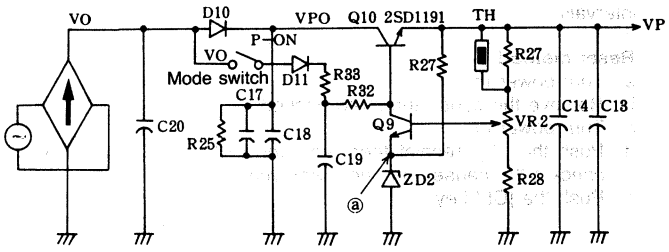


Fig. 4-24

1) The base voltage is not applied to Q10 when V0 is not shorted with P-ON within the mode switch (power off), Q10 is at the OFF state.
2) When V0 is shorted with P-ON, base voltage is added to Q10 so that it goes active.
3) With an active state of Q10, the voltage VP0 starts to rise.
4) When the voltage at point ⓐ reaches 10V via R27, ZD2 then comes active.
5) If the base voltage is added to Q9 in this moment, Q9 is turned on and Q10 turns off.
6) As Q10 turns off, VP0 then starts to drop.
7) As VP0 starts dropping, it also causes Q9 base voltage to decrease and Q9 turns off finally.
8) Q10 starts to rise again and VP0 begins to rise.
9) VP0 is controlled stable by repeating the above steps, 5) thru 8).

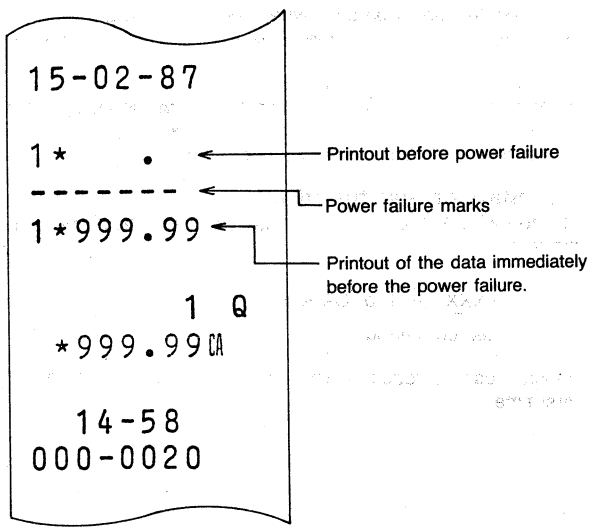
5. Power failure/motor lock mechanical action and measures

5-1. Action at power failure (power off)

When the power is turned off in a middle of printing operation due to a power failure, the CPU executes the power failure process.

(1) When a power failure is encountered during printing operation, power failure marks (.....) are printed on a next line upon the recovery of power, and the printout lost at the time of power failure is correctly produced on a next line.

(2) If power failure was met other than during printing operation, the operation resumes in succession to the operation suspended at the time of power failure, when the power supply is recovered.



5-2. Action at the time of a printer motor lock-up

When the motor stops rotating due to a paper misfeed, etc., the power supplied to the motor is suspended to prevent the motor coil from burning out. An intermittent beeping will occur at one second intervals.

Reset method

a. Turn power off.
b. Remove the cause the motor locked.
c. Turn power on.
d. Push the [↑] (receipt feed) key and [↑] (journal feed) key to check if the cause has been removed.
e. Push the [CL] key.

6. Adjustments

6-1. Clock adjustment

VR1 (100KΩ), TP1⟷GND
Refer to Paragraph 4-1.

6-2. Error adjustment

Trimmer capacitor C5, TP1⟷GND
Since it has been factory adjusted, no adjustment should be made.

6-3. Printer speed adjustment

VR2 (6.8KΩ), TP2⟷GND

VR2 adjustment

The Q9 base voltage can be changed using VR2 to adjust printer speed.

1) Apply the oscilloscope probes across GND and the test pin TP2.
2) Do master reset and feed journal paper continuously.
3) Observe the waveform on the oscilloscope and adjust it as shown below.

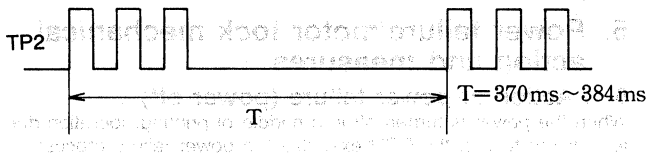


Fig. 4-25

7. Test functions (ER-1910/1920/2385/2395)

7-1. Prerequisite

This test function operates when the test program stored in the SC1003C CPU internal ROM. The following are required in order to execute the function.

a. The power supply to the logic circuit must be normal.
b. Both the CPU input pins and CPU internal logic circuits are functioning normally and that the entire KDC (μPD7507), and its address and data buses are operating normally.

7-2. Start of test function

The following key operation is required in the SRV1 mode to start the test.

XXXX → [TL] or [CA/AT]
Test command

Master reset is required when the system is to be started for the first time.

7-3. List of test commands

Test No.	Test command	Test description
1	1	Clerk/Mode switch test
2	XXXX02 *1	Keyboard test
3	3	Display and buzzer test
4	4	Receipt ON/OFF switch test
5	5, 6, 7, 8	Drawer open test (The code 6 to 8 are for optional drawers)
6	9	Continious print tes
7	10, 11, 12	ROM test
8	13	RAM test
9	14	Key position code test
10	15	System clock test
11	16	Counter clock test
12	XXXX00 *1	Sequential test – 1
13	XXXX22 *1	Sequential test – 2 (drawer open sensor disregarded)
Note: *1 XXXX:	Sum check data for standard key layout	ER-1910→ 548 ER-1920→ 916 ER-2385→ 815 ER-2395→ 1062

NOTE-1: Test message is printed on both the receipt and journal.
NOTE-2: The contents of the totalizer and the preset values are not erased by the test.
NOTE-3: Clerk switch test is applicable only for the ER-1920, 2395. Ignore the test for the ER-1910, 2385.

7-4. Test description

1) Test No.1: Clerk and mode switch test
① Key operation
Push the clerk switch→clerk switch E.
Then, push the clerk and mode switches in the following order.

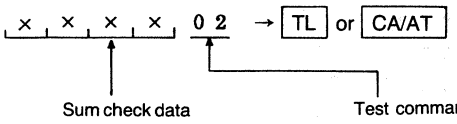
Clerk and mode switch operation	Display
Clerk SW. A	↑ With clerk switch model only. If not, skip this part. 01
Clerk SW. B	02
Clerk SW. D	04
Clerk SW. E	08
Mode SW PGM	01
[∞] or VOID	02
⏻ or OFF	
OPX/Z or TIME	03
REG	04
X1	05
Z1	06
X2/Z2	07
SRV1	0.00

② Description
As the clerk and mode switch position number is displayed, check the number.
③ Termination
The mode can be terminated when the mode switch is turned to the SRV1 side from other position.
Termination print at error -------01E

Termination print at normal end 01

NOTE:Though the display may sway during this test, it is not a malfunction.

2) Test No.2: Keyboard
① Key operation



(1) Enter the test command in succession to the sum check data of the model.

Key operation	Display
ER-1910→ 548 ER-1920→ 916 ER-2385→ 815 ER-2395→ 1062 TL or CA/AT TL or CA/AT *(See Note "Sum check data")	54802 91602 81502 106202 08 00

(2) Next, push every key on the keyboard except for the receipt and journal keys.
When the [TL] or [CA/AT] key is depressed, the termination printout is immediately produced assuming that all keys have been depressed.
There is no order in which the keys have to be depressed.

[Keyboard position code of model vs. key to be depressed]
[All key position code]

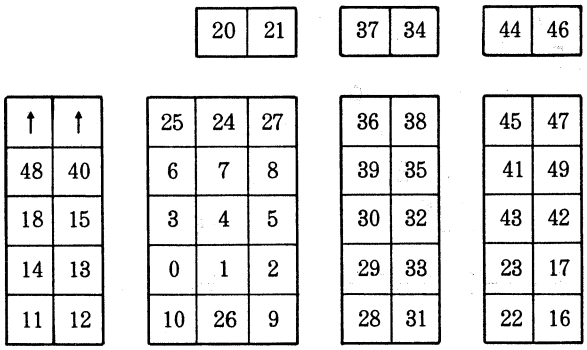


Fig. 7-1

[ER-1910]

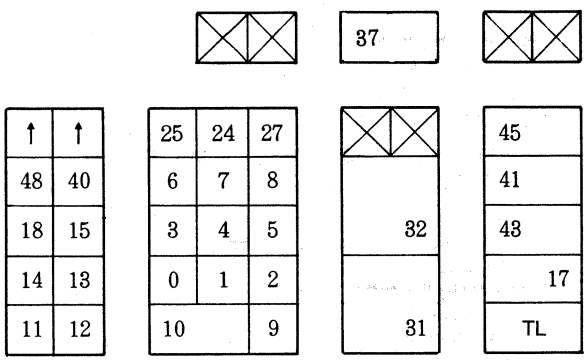


Fig. 7-2

[ER-1920]

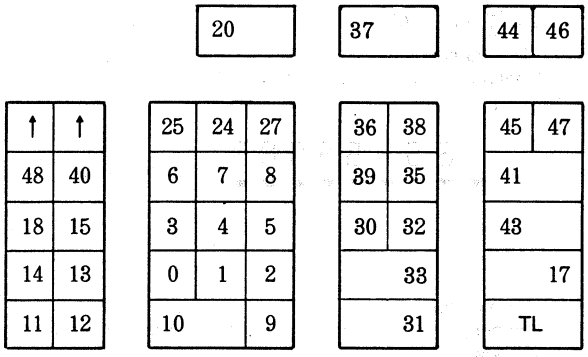


Fig. 7-3

[ER-2385]

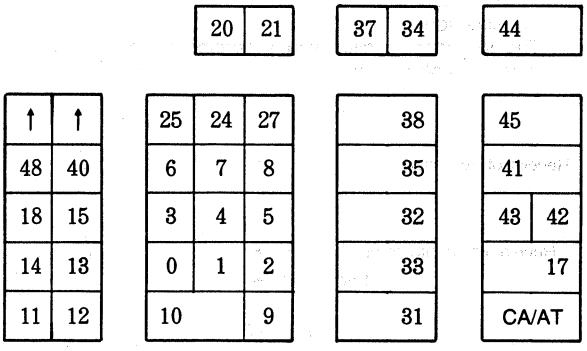


Fig. 7-4

[ER-2395]

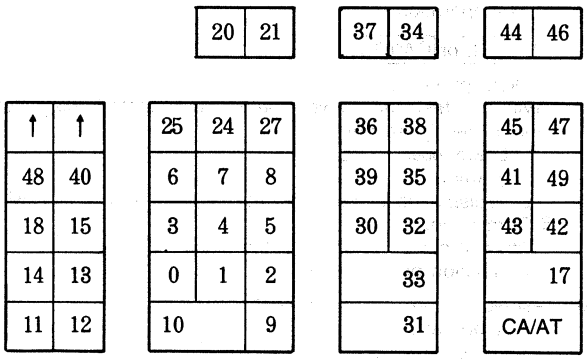


Fig. 7-5

② Description
Until the depression of the [TL] or [CA/AT] key, the sum of key position codes is compared with the sum check data, except for the [TL] or [CA/AT] key.

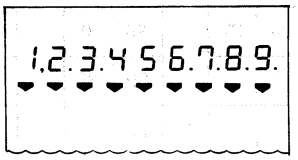
③ Termination
The test terminates with the depression of the [TL] or [CA/AT] key and the termination printout is produced.

Termination printout 02

Termination printout with error -------02E

NOTE: Sum check data
The sum check data shown in the example is based on the standard key layout for the each model.
If the machine has a key layout other than the standard layout, the sum check must be calculated by adding all the key position codes to be depressed, then use the sum as its sum check data. (Refer to Fig. 7-1)

3) Test No.3: Display buzzer test
① Key operation
3→TL or CA/AT
② Description
Continuous beeps and display are tested.



State of display

Fig. 7-6

③ Termination
The beep stops with any key depression and the display returns to show 0.
Termination print 03

4) Test No.4: Receipt on/off switch test
① Key operation
4→TL or CA/AT
② Description
The following is displayed according to the location of the receipt on/off switch.

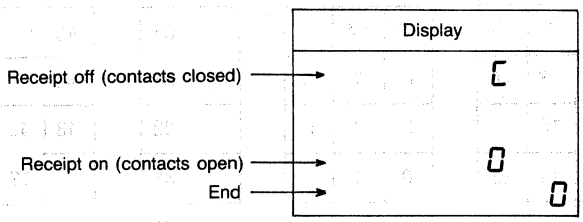


Fig. 7-7

③ Termination
With depression of any key, the display shows 0.
Termination print 04

5) Test No.5: Drawer open test
① Key operation
5 → TL or CA/AT
② Description
With this test, the drawer opens and its state is displayed in the following manner:
Drawer open → □
Drawer closed → C
"C" is displayed for the model that has no drawer sensor switch.
③ Termination
With depression of any key, the display shows 0.
Termination print 05

6) Test No.6: Continuous print test
① Key operation
9 → TL or CA/AT
② Description
Receipt switch at OFF: Continuous printing is done.
Receipt switch at ON: After a cycle of printing, the operation terminates automatically.
③ Termination
When the receipt switch is turned from OFF to ON position while printing is continuing, the test termination after a cycle of printing.

[A continuous print example]

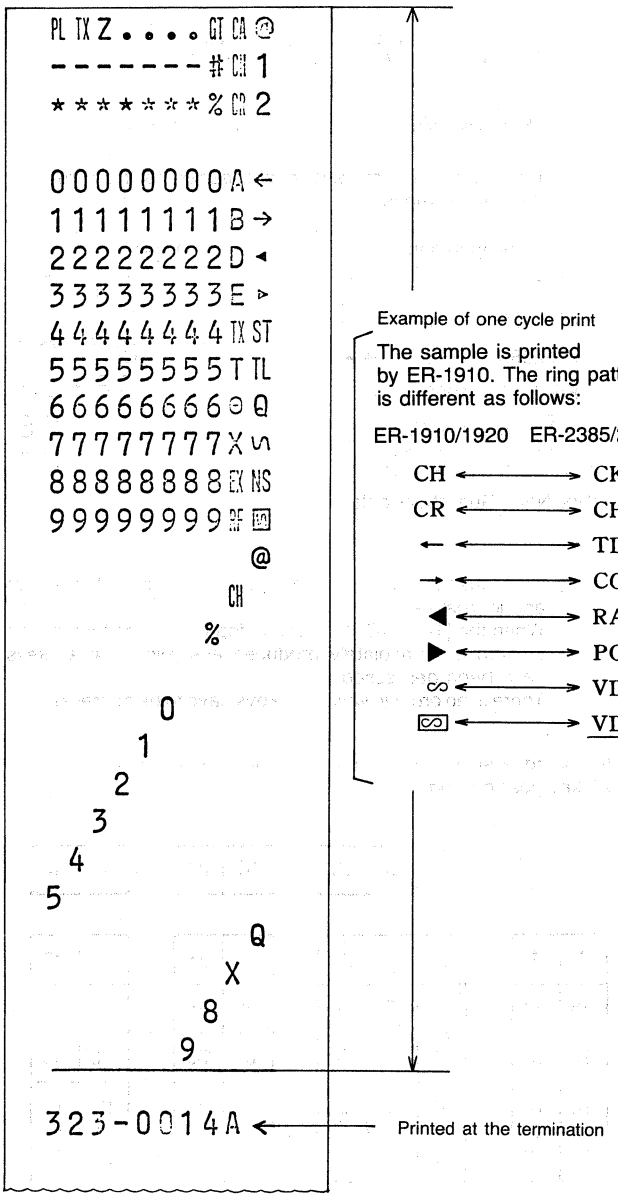
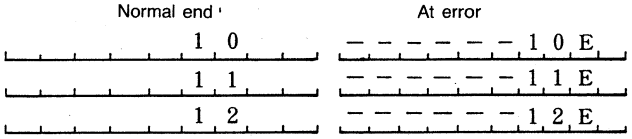


Fig. 7-8

7) Test No.7: ROM test
① Key operation
CPU internal system ROM (0000H~0FFFH)
10 → TL or CA/AT
CPU internal application ROM (8000H~FF7FH) or 27256 SOS ROM
11 → TL or CA/AT
27128/SOS ROM (2000H~3FFFH)
12 → TL or CA/AT
② Test results
Termination print



8) Test No.8: RAM test
① Key operation

13 →[TL]or[CA/AT]

② Description
Though read/write test is conducted from the address 4000H to 5FFFH, the data are secured as they are saved before the test started.

③ Test results Termination print

At normal end → 1 3

Error → 1 3 E

9) Test No.9: Key position code read test
① Key operation

14 →[TL]or[CA/AT]

② Description
Key position of a key on the keyboard is displayed when any key is depressed. (Hardware key contacts code)
The receipt and journal keys only feed paper without displaying, and the [TL] or [CA/AT] key is used to terminate the test.
For key position codes displayed, refer to Fig.7-1 to 7-5.

③ Termination
Push the [TL] or [CA/AT] key.
Termination print 14

10) Test No.10: System clock test
① Key operation

15 →[TL]or[CA/AT]

② Description
Used for the adjustment of the KDC (μPD7505C) system clock. An 880 to 900μs pulse is generated from P21 (pin 30) of the KDC. The display becomes blanking.
For detail of adjustment, refer to the paragraph discussing circuit description.

③ Termination
Set the mode switch to the PGM side.
Termination print 15

11) Test No.11: Counter clock test
① Key operation

16 →[TL]or[CA/AT]

② Description
For error adjustment, a 2048Hz pulse is issued from P21 (pin 3) of the KDC (μPD7507C). The display goes blank.
This test is for the factory adjustment only.

③ Termination
Set the mode switch to the PGM side.
Termination print 16

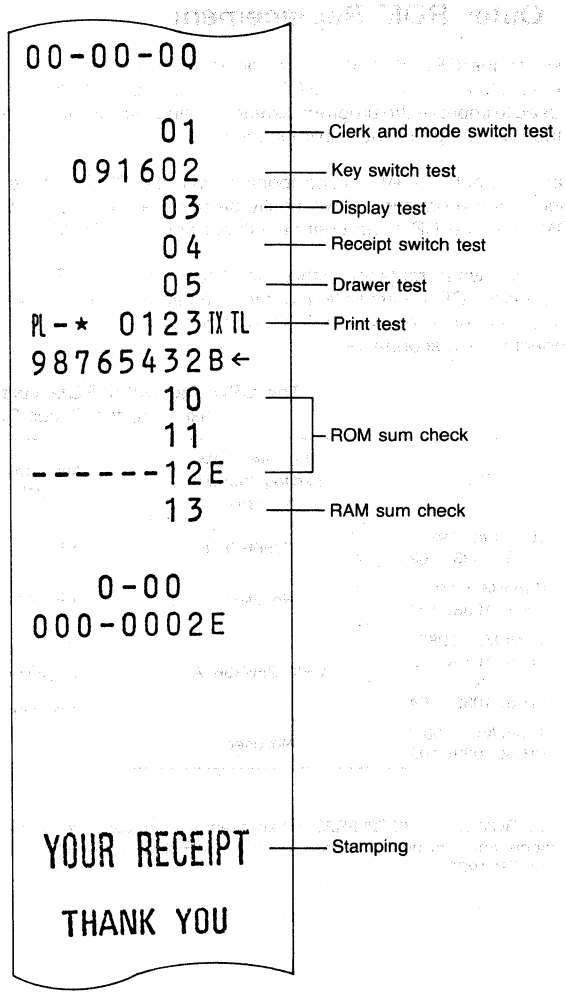
12) Test No.12: Sequential test-1
① Key operation

× × × × 00 →[TL]or[CA/AT]

Refer to 2) test No.2 for the sum check data.

② Description
Within one second after the key operation, the test nos 1 thru 8, are able to carry out continuously.
NOTE-1: If a drawer sensor is equipped for test NO.5, the control proceeds to a next step when the drawer is closed after it was opened. If the sensor is not equipped, the control jumps to a next step assuming it has no drawer is installed.
NOTE-2: Simple print is done for the continuous print test of test No.6.
NOTE-3: An error is always evoked, if the 27128 SOS ROM is not mounted or 27256 SOS ROM is mounted at test No.7-12.

[A print example after the test]



* The upper four digits shows the sum of key position codes which have been pressed in the key switch test.

Fig. 7-9

③ Termination
All tests automatically terminate upon finishing the stamp test.

13) Test No.13: Sequential test-2
① Key operation

× × × × 22 →[TL]or[CA/AT]

Refer to 2) test No.2 for the sum check data.

② Description
It is similar as the test No.12 except that it ignores the drawer open sensor of the test No.5.

8. Service Precaution on the CPU and Outer ROM Replacement

Basically the CPU SC1003C is so designed to operate by its own program stored in the internal ROM. However, an outer ROM may be used to improve the program instead of using the internal ROM at the early stage of the implimentation.

Even if an outer ROM is used together with the CPU at the early stage of the production, it will finally be replaced with the internal ROM, then the CPU can operate without any outer ROM.

Therefore, when replacing either the CPU or the outer ROM, or replacing the CPU/outer ROM together to a new CPU, the following care should be exercised and the each jumper wire must be connected or disconnected.

The CPU and Outer ROM Version and the Jumper Wire Connection Table
(Refer to the Circuit Diagram 00ZER2395CD1M on page 5)

CPU	The outer ROM used together with the CPU.	Applicable models	Jumper wires	J1		J2		J3		J4
			Terminal Name (Signal)	C-1 (+5V)	C-2 (A15)	C-1 (+5V)	C-2 (A14)	C-1 (A15)	C-2 (CS2)	(GND)
(Until Feb. 1987) VHISC1033C102	VHI27256R281B*1	ER-1910	Jumper wire connection	X	○	X	X	○	X	○
(From Mar. 1987) VHISC1033C104	Not used	ER-1920		X	○	X	X	X	X	△
(Until Mar. 1987) VHISC1033C102 or VHISC1033C104	VHI27256R361A	ER-2385 ER-2395		○	X	X	○	○	X	○
(From April. 1987) VHISC1033C103	Not used			X	○	X	X	X	X	△

○ : To be connected.
X : To be disconnected.
△ : When J4 is being connected, it may leave as it is.

*1: The ROM type VHI27256R281A had been used for Jan. 1987 production except for Switzerland model and has been changed to VHI27256R281B from Feb. 1987 production for all ER-1910 and ER-1920.